Department of Energy
Ohio Field Office
Fernald Area Office
P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155

AUG 27 1997
DOE-1347-97

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF FINAL OPERABLE UNIT 3 THORIUM/PLANT 9 COMPLEX IMPLEMENTATION PLAN

References: Letter, J.A. Saric to J.W. Reising, "Plant 9 Implementation Plan," dated August 12, 1997.

Letter, T.A. Schneider to J.W. Reising, "Ohio EPA Approval of the Response to comment Package on the Thorium/Plant 9 Implementation Plan," dated May 9, 1997.

The purpose of this letter is to transmit to the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) the enclosed final version of the Operable Unit 3 (OU3) Thorrium/Plant 9 Complex Implementation Plan for Above-Grade Decontamination and Dismantlement (D&D). The implementation plan incorporates all revisions approved by the U.S. EPA and OEPA through comment responses submitted in April and June of 1997.

If you or your staff have any questions, please contact Art Murphy at (513) 648-3132.

Sincerely,

Johnny Reising

FEMP:Murphy

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosure: As Stated

cc w/enc:

N. Hallein, EM-42/CLOV
L. Parsons, DOE-OH
J. Trygier, DOE-FEMP
G. Jablonowski, USEPA-V, 5HRE-8J
R. Beaumier, TPSS/DERR, OEPA-Columbus
T. Schneider, OEPA-Dayton (3 copies total of enc.)
F. Bell, ATSDR
D. S. Ward, GeoTrans
R. Vandegrift, ODOH
R. Geiger, PRC
T. M. Beasley, FDF/44
T. R. Clark, FDF/52-3
P. R. Courtney, FDF/44
L. C. Goidell, FDF/65-2
T. Hagen, FDF/65-2
J. Harmon, FDF/90
R. M. Nichols, FDF/44
AR Coordinator/78

cc w/o enc:

A. Tanner, DOE-FEMP
R. Heck, FDF/2
S. Hinnefeld, FDF/2
EDC, FDF/52-7

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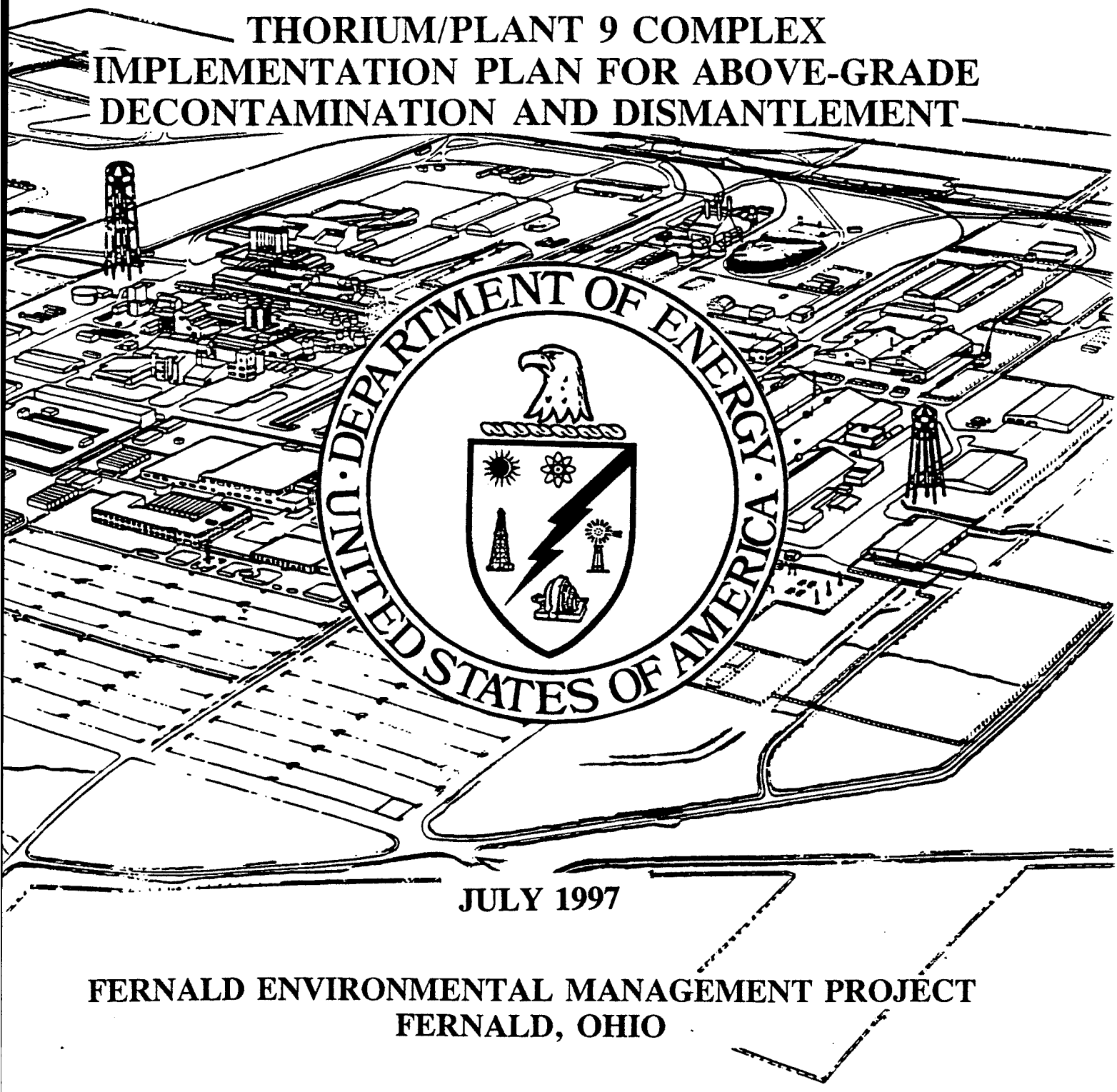
OPERABLE UNIT 3
INTEGRATED REMEDIAL ACTION

THORIUM/PLANT 9 COMPLEX
IMPLEMENTATION PLAN FOR ABOVE-GRADE
DECONTAMINATION AND DISMANTLEMENT



JULY 1997

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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FINAL

ENGINEERING DOCUMENT CONTROL NO. 2503-RA-0005 (REV. 0)

OPERABLE UNIT 3
INTEGRATED REMEDIAL ACTION

THORIUM/PLANT 9 COMPLEX IMPLEMENTATION PLAN FOR ABOVE-GRADE DECONTAMINATION AND DISMANTLEMENT

JULY 1997

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
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U. S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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DOCUMENT CONTROL NO. 2503-RA-0005 (REV. 0)

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NOTATION

Abbreviations, Acronyms, and Initials

ACM	asbestos-containing material(s)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, as amended
CFR	Code of Federal Regulations
CMU	concrete masonry unit
COC	Constituents of Concern
CPID	Closure Plan Information and Data package
DF&O	Directors Findings and Orders
DOE	United States Department of Energy
D&D	decontamination and dismantlement
EL	End-loading [container]
FEMP	Fernald Environmental Management Project
HEPA	high-efficiency particulate air [filter]
HVAC	heating, ventilating, and air conditioning
HWMU	Hazardous Waste Management Unit
IROD	Operable Unit 3 Record of Decision for Interim Remedial Action
N/A	not applicable
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NTS	Nevada Test Site
OEPA	Ohio Environmental Protection Agency
OU3	Operable Unit 3
OU3 RI/FS WPA	OU3 RI/FS Work Plan Addendum
PCB(s)	polychlorinated biphenyl(s)
PCDF	permitted commercial disposal facility
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act, as amended
RD/RA	remedial design/remedial action
RI	remedial investigation
ROB	roll-off box
ROD	Record of Decision
RvA	Removal Action
SAP	Sampling and Analysis Plan
SCQ	FEMP Sitewide CERCLA Quality Assurance Project Plan
SOW	Statement of Work
SWIFTS	Site-Wide Waste Information, Forecasting and Tracking System
TL	top-loading [box]

Abbreviations, Acronyms, and Initials (Cont'd.)

TCLP	Toxicity Characteristic Leachate Procedure
TSI	thermal system insulation
U.S. EPA	United States Environmental Protection Agency
WAC	Waste Acceptance Criteria
WMB	white metal boxes (small)
WWTS	waste water treatment system

Units of Measure

cm.	centimeter(s)
cm^2	square centimeter(s)
dpm	disintegration(s) per minute
ft.	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
gal.	gallon(s)
in.	inch
mg/L	milligrams per liter
pCi/g	picoCuries per gram
μg/g	microgram per gram

Chemical Symbols

Al	aluminum
As	arsenic
Ba	barium
Cd	cadmium
Cr	chromium
Elem. U	elemental uranium
HF	hydrofluoric acid
K	potassium
MgF_2	magnesium fluoride
NaOH	sodium hydroxide
Pb	lead
Ra	radium
Se	selenium
Tc-99	technetium-99
Th-228	thorium-228
U	uranium
U-238	uranium-238
U_3O_8	uranium oxide
UF_4	uranium tetrafluoride
UNH	uranyl nitrate hexahydrate
UO_2	uranium dioxide
UO_3	uranium trioxide
V	vanadium
Zn	zinc

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1.0 INTRODUCTION

1.1 Project Statement

The purpose of this implementation plan is to summarize the Thorium/Plant 9 Complex project-specific remedial design for decontamination and dismantlement of the above-grade portions of the components contained in the Thorium/Plant 9 Complex which is located in Operable Unit 3 (OU3) at the U.S. Department of Energy's (DOE) Fernald Environmental Management Project (FEMP) in Fernald, Ohio. At- and below-grade remediation is not included within the scope of this project. This implementation plan was developed consistent with the remedial design strategy presented in the OU3 Integrated Remedial Design/Remedial Action (RD/RA) Work Plan (DOE 1997a), and is being submitted to the U.S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (Ohio EPA) in compliance with the enforceable milestone established for this implementation plan submittal. Although the remedial design for the Thorium/Plant 9 Complex initially used implementation strategies defined in the OU3 RD/RA Work Plan for Interim Remedial Action (DOE 1995), the completion of the remedial design involved the use of updated RD/RA strategies defined in the OU3 Integrated RD/RA Work Plan. The submittal of this implementation plan replaces the submittal of multiple design and construction documents that are described in Sections 4.1 and 4.2 of the OU3 Integrated RD/RA Work Plan.

The project implementation details contained in this implementation plan elaborate on programmatic strategies presented in the OU3 Integrated RD/RA Work Plan, project- specific strategies developed for the remediation subcontract Statement of Work (SOW) (Part 6 of the bid document), and performance specifications (Appendix B of the OU3 Integrated RD/RA Work Plan).

1.2 Scope of Work

The above-grade Thorium/Plant 9 Complex decontamination and dismantlement project includes the following major activities:

- Hazardous Waste Management Unit decontamination;
- asbestos abatement/removal;
- surface decontamination;
- above-grade component dismantlement;
- material management; and
- environmental monitoring.

The following components are included in the Thorium/Plant 9 Complex:

- Building 9A - Special Products Plant;
- Building 9B - Plant 9 Sump Treatment Facility;
- Component 9C - Plant 9 Dust Collector;
- Building 9D - Plant 9 Substation;
- Building 9E - Plant 9 Cylinder Shed;
- Building 9F - Plant 9 Electrostatic Precipitator;
- Building 32A - Magnesium Storage Building;
- Component 32B - Building 32 Covered Loading Dock;
- Building 64 - Thorium Warehouse;

- Building 65 - (Old) Plant 5 Warehouse;
- Building 69 - Decontamination Building;
- Building 78 - D&D Building;
- Building 81 - Plant 9 Warehouse;
- Component G-001 - Railroad tracks; and,
- Component G-008 - Pipe bridges.

In addition to the above listed components, the remediation will include above-grade utility poles on the Plant 9 Pad (Component 74K).

The remedial design for the Thorium/Plant 9 Complex was performed in three phases; the performance specifications for decontamination and dismantlement were originally certified for construction on February 21, 1995 for the Plant 9 portion of the complex (Buildings 9A, 9B, 9C, 9D, 9E, 9F, and 81) and on August 1, 1995 for most of the remaining components within the complex (Buildings 32A, 32B, 64, 65, and 78). Building 69 and the miscellaneous components (G-001, G-006, G-008) have been added to the complex as a result of the accelerated remediation planning schedule. The third phase of remedial design included the revision of performance specifications to be consistent with those included in the OU3 Integrated RD/RA Work Plan. The third phase also included the performance of the disposition evaluation methodology for accessible metals that will be generated during the remedial action. This plan also discusses two preparatory actions that were completed prior to initiation of decontamination and dismantlement: the removal of existing product and waste inventories, and safe shutdown.

The sequence, schedule, and component-specific remediation requirements for at- and below-grade dismantlement are contingent on RD/RA scheduling for soil remediation within the former Production Area and will be addressed in the appropriate RD/RA submittals for the Soil Characterization and Excavation Project (SCEP).

In accordance with the draft OU3 Integrated RD/RA Work Plan, the Thorium/Plant 9 Complex remediation activities have been planned utilizing a performance-based methodology using performance-based specifications as described in Section 3.1.3 and 4.1 of that work plan, and are also included in Appendix B of that work plan. Appendix C of this implementation plan provides a current list of those performance specifications which also apply to this project.

The use of performance specifications for project implementation requires that the remediation subcontractor develop work plans, subject to DOE approval, which will specify proposed remediation methods necessary to accomplish certain tasks and meet project objectives. The sequence for performance of remedial activities may differ from the sequence in which they are presented in this implementation plan since the remediation subcontractor's work plan may propose an alternate sequence.

DOE will provide notification to the regulatory agencies of any significant changes to the design prior to their implementation. Should the regulatory agencies have any concerns regarding any significant design change, DOE will properly address those concerns as soon as practicable and, if necessary, perform one or more of the following: amend the implementation plan, amend the OU3 Integrated RD/RA Work Plan, submit an explanation of significant difference to the RODs, and/or amend the RODs. Significant changes to the design will require formal design modification and may require that affected activities be suspended until the revision has been completed and approved. This course of action adheres to the

commitments made in Section 4.2.2 of the OU3 Integrated RD/RA Work Plan for design changes.

1.3 Plan Organization

This implementation plan is comprised of five sections and five appendices. Section 1 contains the remedial action project statement, scope of work, an overview of this implementation plan, and a brief description of the Thorium/Plant 9 Complex. Section 2 describes the overall approach to implementing the Thorium/Plant 9 Complex remediation project, as applied from the OU3 Integrated RD/RA Work Plan. That approach includes a sequence for remediation of components, a plan for materials management, environmental monitoring activities, and an overview of the six-task approach for implementing above-grade remediation. Section 3 presents specific notable aspects of the six remedial tasks for each component. Section 4 presents the schedule for remediation and project reporting. Section 5 describes notable aspects of the project management approach.

Appendix A contains a summary table that estimates the types and quantities of environmental and occupational sampling for this project, based on the assumptions in the Sampling and Analysis Plan (SAP) for the OU3 integrated remedial action, contained in Appendix D of the OU3 Integrated RD/RA Work Plan, and on the remediation requirements presented in this plan. Appendix B provides a summary of the disposition evaluation methodology for accessible metals. Appendix C provides the list of the most recent performance specifications that were developed for the remediation subcontractor procurement package for this project. Appendix D provides copies of drawings made available during design which show floor plans and elevations of buildings. Appendix E contains selected photographs of notable features of, within, or around the buildings so as to provide an overall perspective of the buildings, associated equipment, and appurtenances.

1.4 Location of the Thorium/Plant 9 Complex Project Area

The Thorium/Plant 9 Complex project area is located north of 2nd Street and East of 'D' Street, in the northeast portion of the former production area, as shown in Figure 1-1.

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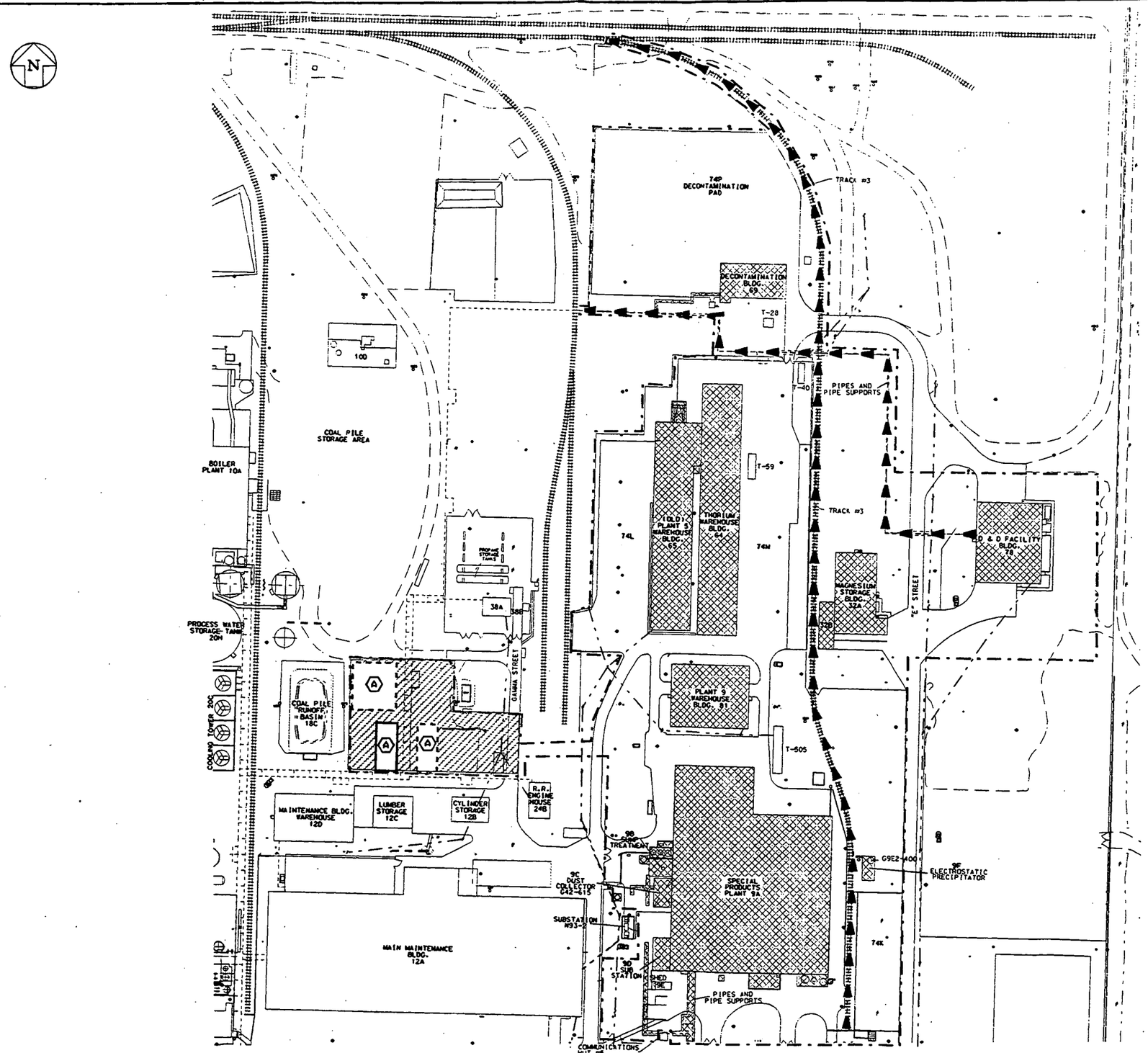


LEGEND

- FACILITIES TO BE DEMOLISHED
- CHANGE OUT/CAFETERIA AREA
- MISC TO BE REMOVED
- (A) PROPOSED SUPPORT FACILITY
- SUBCONTRACTOR CONSTRUCTION ZONE BOUNDARY

LIST OF BUILDINGS/COMPONENTS TO BE REMOVED

9A	SPECIAL PRODUCTS PLANT
9B	SUMP TREATMENT
9C	DUST COLLECTOR
9D	SUB STATION
9E	SHED
9F	ELECTROSTATIC PRECIPITATOR
32A	MAGNESIUM STORAGE
32B	COVERED LOADING DOCK
65	PLANT 5 WAREHOUSE
64	THORIUM WAREHOUSE
69	DECOTAMINATION BLDG.
78	D & D FACILITY
81	PLANT 9 WAREHOUSE

TANKS F1-1, F1-2, F1-3, T-2429, PPT. WATER ACID, ACID, F-9NI-700, G9E2-400,
MISCELLANOUS: PIPES, PIPE SUPPORTS AND RAILROAD TRACKS

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING WERE PREPARED FROM FEMP SITE PROVIDED DATA FROM THE DOCUMENTS LISTED BELOW.

   EXISTING SITE DATA SOURCE (IN PLANT FILES)
   FEMP CADD GRID/UTILITY DRAWINGS
   FEMP CONTRACTOR PROJECT DESIGN DOCUMENTS

2. INFORMATION ON THE LOCATIONS OF EXISTING FEATURES SHOWN ON THIS PLAN WERE TAKEN FROM FERNALD SITE DRAWINGS. NO FIELD VERIFICATION BY SURVEY HAS BEEN PERFORMED.

3. SUBCONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS INCLUDING ELEVATIONS BEFORE STARTING CONSTRUCTION AND/OR FABRICATION. ANY DEVIATIONS NOTED SHALL BE BROUGHT TO FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER'S ATTENTION IN WRITING IMMEDIATELY AND RESOLVED BEFORE CONTINUING WITH CONSTRUCTION.

4. EXISTING HARD SURFACE PAVEMENTS (ASPHALT, CONCRETE, ETC.) TO REMAIN UNDISTURBED UNLESS APPROVED BY FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER.

5. SUBCONTRACTOR SHALL PROTECT ALL UNDERGROUND UTILITIES AND MONITORING WELLS. SEE DRAWING 22C-5500-P-00668, 22C-5500-P-00669, 22C-5500-P-00670, 22C-5500-P-00660, 22C-5500-P-00661, 22C-5500-P-00662 FOR UTILITIES.

6. LAYDOWN AREAS SHALL BE DETERMINED BY SUBCONTRACTOR WITH APPROVAL BY FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER.

7. AT THE COMPLETION OF THE PROJECT, SUBCONTRACTOR SHALL REMOVE AND STORE THE TEMPORARY CONSTRUCTION FENCE AND GATES IN THE LOCATION DESIGNATED BY FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER.

8. FOR DIMENSIONS AND DETAILS OF BUILDING FACILITIES REFERENCE THE EXISTING FILE DRAWINGS.

9. CONTRACTOR SHALL VERIFY THAT THE UTILITIES TO PIPE RACK HAVE BEEN PROPERLY DISCONNECTED AND END CAPPED. UTILITY DISCONNECT AND CAPPING WORK BY FLOUR DANIEL, FERNALD.

10. RADIOLOGICAL CONTROL FENCES WILL BE INSTALLED BY FLOUR DANIEL, FERNALD.

11. TRAILERS T-40,59, AND 28 TO BE REMOVED PRIOR TO THE START OF THE PROJECT

PRELIMINARY
INFORMATION ONLY
CADD SERVICES

000011

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	UPDATED CHANGE OUT AREA, NOTES, TRAILERS	4-24-97	JSW	GEP
0	CFC	3-24-97	JSW	GEP

NOTE: FLUOR DANIEL FERNALD CADD DRAWING, DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

APPROVALS			
			SAFETY ENG.
CIVIL & STR.			MAINTENANCE
ELECTRICAL			FIRE PROTECT.
ENGINEER	P. COURTNEY	3-24-97	WASTE MANAGE.
INSTRUMENT			SECURITY
MECHANICAL			CRU
			CONTRACTOR
CHECKED	GEP		
APPROVED	G. E. PAUL	3-24-97	

COGNIZANT ENGINEER DATE

Fernald Environmental Management Project

FLUOR DANIEL FERNALD

U.S. DEPARTMENT OF ENERGY

PLANT 9 AREA

THORIUM PLANT 9 AREA COMPLEX
CIVIL DEMOLITION PLAN
NO SCALE

DES. 3178	
DATE May 21, 1997	09X-5500-X-03973 1
DRAWN JSW	

FORMAT REVISED 11/5/96 FDF3.DGN

FIGURE 1-1 Thorium/Plant 9 Complex Project Area

2.0 GENERAL PROJECT REMEDIATION APPROACH

The overall approach to the decontamination and dismantlement of Thorium/Plant 9 Complex incorporates the applicable programmatic elements and tasks that were described in Section 3 of the OU3 Integrated RD/RA Work Plan. This section describes the notable aspects of the overall approach evaluated during remedial design and addressed in the subcontract documents.

2.1 Sequencing of Remediation

The main factors which affect the sequence for the remediation of components in the Thorium/Plant 9 Complex are scheduling constraints associated with ongoing projects, and facility use considerations. Decontamination and dismantlement of Buildings 64 and 65 will not begin until completion of the Thorium Overpacking Project (TOP) which is currently scheduled to be completed in September 1997, and the Thorium/Mixed Waste Stabilization Project in September 1998. The potential mixed waste presently stored in the Plant 9 Warehouse (81) will be sampled and analyzed. If the wastes are determined to be mixed, treatment will be required prior to disposition under the Thorium/Mixed Waste Stabilization Project. Buildings 64 and 65 are currently included in the remediation subcontractor bid package as an option due to the potential downtime between dismantlement of other components in the complex and the availability of Buildings 64 and 65. However, in the event the buildings cannot be removed from service in time to warrant exercising the option, an amendment to this implementation plan will be submitted for Agency approval.

It is anticipated that the remediation sequence begins with Building 9A, Building 69, Building 32A and 32B, and Building 81 being available for decontamination and dismantlement first. Decontamination and dismantlement of the Plant 9 ancillary structures (Buildings 9B through 9F) will start after commencement of Building 9A remediation. Building 81 is an also active hazardous waste management unit (HWMU), and will be decontaminated in accordance with the RCRA/CERCLA Integrated Process discussed in the OU3 Integrated RD/RA Work Plan. It is anticipated that Building 78 will be released for remediation approximately two to three months after Notice to Proceed. Release of Buildings 64 and 65 is anticipated for December 1998, which is the expected completion time frame for the Thorium/Mixed Waste Stabilization Project.

2.2 Characterization of the Thorium/Plant 9 Complex

The processes and operations that were performed in the Thorium/Plant 9 Complex components during production included uranium reduction, casting, and related production-support operations in the Special Products Plant (9A), material storage (including hazardous/mixed waste, thorium, and magnesium), and equipment/material decontamination systems. Section 3 of this plan further describes relevant process/production-related information to provide a context for component remediation. The former process operations within the complex utilized both radiological and chemical constituents and generated a wide variety of waste materials.

The radiological survey data compiled during the OU3 Remedial Investigation/Feasibility Study (RI/FS), and provided in the OU3 RI/FS Report (DOE 1996a) provided alpha removable, beta-gamma removable, and total beta-gamma radiological information. This data has been utilized in support of the following Thorium/Plant 9 Complex decontamination and dismantlement

planning and design efforts including, but not limited to:

- developing the safety assessment documentation to support the proposed activities;
- enhancing the project-specific health and safety plan and determining potential concerns for worker protection based on the suggested decontamination and dismantlement techniques;
- enhancing the remediation subcontractor's understanding of expected contamination levels;
- determining personnel monitoring requirements;
- determining the number and location of project-specific radiological ambient air monitors;
- identifying potential gross radiological contamination that may require decontamination prior to the remediation subcontractor activities; and,
- determining disposition options for various primary and secondary material streams generated by the project activities.

OU3 RI/FS data that were used to evaluate material, during the remedial design process, for treatment and disposition, radiological environmental air monitoring needs, and potential wastewater treatment requirements are presented in Appendix B (Attachment B.III) of the OU3 RI/FS Report and, due to the volume of data, are not repeated in this section.

The most significant results from the remedial design data evaluation are those which are relevant to identifying and managing certain materials for treatment and off-site disposition, consistent with the decisions made in the OU3 Record of Decision for Final Action (DOE 1996b). The results of the evaluation reveal the following:

- the top inch of concrete from both the Enriched Uranium Casting Process Area and the Uranium Machining Process Area in Plant 9 (9A) (see Figure D-3, Appendix D), totalling an estimated 1,699 cubic feet, contains elevated levels of technetium-99 — requiring that at least the top inch of concrete be removed and disposition off-site;
- potential mixed waste acid brick, totalling an estimated 1,437 cubic feet are located in the Zirnlo Decladding process area, Heat Treating process area, and the Briquetting process area in Plant 9 (9A) and will be dispositioned for off-site;
- approximately 959 cubic feet of potential mixed waste acid brick in Building 69 that has been administratively designated for off-site disposition; and
- approximately 15 cubic feet of mixed waste lead flashing exist in Plant 9 (9A), the Thorium Warehouse (64), and the Plant 5 Warehouse (65) and will be treated and dispositioned either off-site, or recycled.

The result of the material data evaluation, summarized above, is the proper identification of specific materials that have special handling requirements in the project specifications and subcontract scope of work.

2.3 Materials Management

The project specific application of material management strategies presented in Section 3.3 of the OU3 Integrated RD/RA Work Plan are outlined in this section.

Specification 01120 of the performance specifications (Waste Handling Criteria) and the Waste Management Plan included in the bid document, and discussed in Section 4.1.3 of the OU3 Integrated RD/RA Work Plan, specifies the remediation subcontractor requirements for managing material resulting from all project tasks. Based on the requirements specified in Specification 01120, a mobilization work plan that details waste handling methods and procedures will be prepared by the remediation subcontractor. Waste minimization will be accomplished, in part, by unpacking equipment and material prior to entering the radiologically controlled area whenever possible, limiting the number of tools and equipment that could become contaminated, and limiting the quantities of hazardous material brought into the construction zone.

2.3.1 Primary Materials Management

Primary materials include dismantlement debris and other bulk waste materials from the Thorium/Plant 9 Complex components. As a result of the revision of performance specifications done in the past to address material handling requirements stipulated by amendments to Removal Action 17 in August 1996 and OU3 Final Action ROD, this implementation plan reflects material management applications that are consistent with the requirements for treatment and disposition of materials discussed in the OU3 Integrated RD/RA Work Plan.

As discussed in Section 2.2, the results of material evaluation performed during design revealed that certain primary materials must be managed for off-site treatment and/or disposal. Section 2.3.4 discusses how these materials will be segregated, containerized, and dispositioned. An additional evaluation of materials using the disposition evaluation methodology for accessible metals was also performed, and a summary of the results is presented in Appendix B.

2.3.2 Secondary Waste Management

Management of secondary wastes includes handling, sampling, storage, and disposition of secondary waste materials generated during remediation. Secondary waste includes vacuumed dust, filters, filter cake, personal protective equipment (PPE), spent consumables, and washwaters.

Depending on the subcontractor's approved method(s) of decontamination, wastewater may or may not be generated during that activity. It is expected that decontamination using high pressure water spray will be used for decontamination of at least the subcontractor's equipment to allow for unrestricted release of those materials back to the subcontractor. Specification Section 01517 describes the requirements for managing wastewater. Since the remedial design for this project utilizes performance specifications, it is the subcontractor's

responsibility to adhere to propose and implement a wastewater management system that has been approved by the project management team. Part 1.5.A of Specification Section 01517 requires that the subcontractor submit for [project management team] approval a work plan in accordance with Part 7 of the subcontract that describes the system design for controlling, filtering, and transporting effluent produced during removal and/or fixing activities. The basic elements of the project wastewater collection system include effluent control through dikes or berms, collection using sumps or other portable collection devices, filtering using two stage filters to remove entrained particulate prior to discharge into holding tank(s), sampling and analysis of water and sludges for constituents of concern (see Section 2.4 for wastewater monitoring), discharge of approved effluent into the FEMP wastewater treatment system (Advanced Wastewater Treatment Facility), and sludge removal and containerization in 55-gallon drums. The particular requirements provided by Specification Section 01517 for wastewater management are highlighted in the following bullets:

- **Submittals:** Part 1.5.A of the specification addresses the requirements for the subcontractor's work plan, which describes the system design for controlling, filtering, and transporting effluent produced during removal and/or fixing activities.
- **Subcontractor's Equipment:** Part 2.1.B of the specification provides requirements related to methods and equipment needed for collection and filtration of wastewater.
- **Requirements Specific to Structure Decontamination:** Part 3.1.D of the specification addresses requirements that must be met prior to generating wash water from decontamination such as sealing floor cracks/seams and building cracks, use of existing building floor sumps for effluent collection, and precautions to prevent the spread of contamination from other more-contaminated areas of the facility.
- **Rinseate/Effluent Handling:** Part 3.1.E of the specification identifies requirements for effluent and sludge collection, sampling and analysis, commingling of effluents and sludges, and container requirements.
- **Sludge Drumming:** Part 3.1.F of the specification stipulates limits on sludge containment for individual drums from enriched washing operations.

The existing sumps that have been identified for potential use in collecting wastewater include two in Building 9A (one each in Process Areas 1 and 4), two associated with Building 69 (one inside the building near the southwest corner and one outside of the building on the pad adjacent to the northwest corner), and two in Building 78 (along the west and southwest sides of the building). Whether or not these sumps are eventually used will be determined through project management's approval of the subcontractor's work plan for wastewater collection. Regardless of which collection method is chosen (i.e., sumps or other portable collection devices), the actual wastewater collection system used will be described in the project completion report to be submitted to regulatory agencies.

Washwater may be sampled for constituents of concern if the Waste Water Treatment System (WWTS) Manager requires analytical data for treatment purposes prior to discharge into the FEMP WWTS. Waste water sampling is described in the SAP which is contained in Appendix D of the OU3 Integrated RD/RA Work Plan. Samples of washwaters will be collected for only those batches that have been determined (through a review of available process information and existing data) to have potentially elevated levels of contaminants of concern, such as volatile organic compounds, heavy metals, uranium and RCRA-listed constituents. Depending on contaminant concentration levels, pre-treatment may be required.

2.3.3 Estimates of Material Volumes

Materials to be generated during this project have been categorized according to the same classification system that was developed for and described in the OU3 RI/FS Report, and draft OU3 RD/RA Integrated Work Plan, and are estimated in Tables 2-1, 2-2, and 2-3. Estimated material volumes are also presented for lead flashing and the concrete to be removed for off-site disposal (from Process Areas 2 and 4 in Building 9A). These latter two types of materials fall within the defined material categories (painted light gauge metals and concrete, respectively), but will be handled separately from the other materials within their respective categories. Where applicable, materials were assigned to a specific container according to current material management strategies, which were described in the OU3 Integrated RD/RA Work Plan, and will be documented in the material segregation and containerization criteria (MSCC) form that will be contained in the bid document. The volume estimates associated with each material segregation category are listed according to general material type, volume (bulked and unbulked), and weight, and the type and number of containers needed. Estimates for spent PPE and consumables are included as either regulated ACM or miscellaneous materials, depending on the activity undertaken when these materials were generated.

The volumes and weights in Tables 2-1, 2-2, and 2-3 were developed by reviewing engineering drawings and performing field inspections to identify and quantify materials. Container types and storage configuration are based on the category of material, characteristics of the material, disposition decisions made under the OU3 Final Action ROD, and anticipated alternative disposition based on the results of the disposition evaluation methodology for accessible metals discussed in Appendix B.

Container types and quantities are also estimated in Table 2-1. Container types correspond to those specified in the MSCC prepared during remedial design. Container quantities are estimated based on the weight or volume restriction placed on each type of container to be used. The two primary assumptions that should be noted regarding the material volume and weight estimates are that all materials are assumed to be radiologically contaminated, and any mixed/hazardous wastes and PCB-contaminated wastes are to be containerized separately.

2.3.4 Material Handling, Staging, Interim Storage, and Disposition

Material Handling/Staging

Pursuant to Specification 01120 materials generated from the decontamination and dismantlement of Thorium/Plant 9 Complex will be reduced in size, segregated, and containerized (if necessary) in accordance with the requirements placed in the MSCC and other subcontract waste management provisions. Containers will then be weighed, inspected, sealed, and tagged for on-site movement. The MSCC will be used by the remediation subcontractor as the basis for all containerizing activities. Although the MSCC provides a high level of detail for the remediation subcontractor, Table 2-1 provides the essential segregation and containerization criteria for this implementation plan. Material size requirements are identical to those provided in the example MSCC contained in Appendix A of the OU3 Integrated RD/RA Work Plan.

Pursuant to Specification 01120, the remediation subcontractor will establish a container queuing area having a controlled boundary within the construction site. The queuing area will be used as a temporary storage area for empty and full debris/waste containers.

Table 2-1 Bulked Material Volume Estimates (ft^3)

Component Designation	Accessible Metals	Inaccessible Metals	Process-Related Metals	Painted Light-Gauge Metals	Lead Flashing	Concrete	Concrete Containing Tc-99[8]	Acid Brick	Non-Regulated ACM	Regulated ACM[1]	Misc. Materials[2]	Component/ Complex Totals
9A	25,244	63,525	23,717	876	6	303	1,699	1,866	4,319	3,473	8,686	133,714
9B	559	2,759	302	8	0	105	0	0	183	125	685	4,726
9C	102	93	0	7	0	0	0	0	0	39	38	279
9D	293	223	0	0	0	0	0	0	265	12	455	1,248
9E	14	0	0	0	0	0	0	0	7	4	19	44
9F	68	148	9	7	0	0	0	0	15	35	57	339
32A	1,658	663	0	5	0	6,530	0	0	0	93	2,724	11,673
32B	290	37	0	0	0	0	0	0	0	4	426	757
64	3,297	3,720	0	212	6	1,560	0	0	40	0	2,758	11,587
65	4,497	1,315	0	144	4	0	0	0	0	0	1,505	7,465
69	2,599	821	57	33	0	7,313	0	1,245	0	235	2,249	14,552
78	3,985	14,023	1,431	97	0	10,608	0	0	0	0	3,224	33,280
81	1,347	761	0	80	0	0	0	0	0	0	143	2,331
Misc[9]	4,159	0	0	0	0	0	0	0	0	0	2,433	6,592
Total	48,112	88,080	25,516	1,469	16	26,419	1,699	3,111	4,741	4,020	25,402	228,585
Container/ Quantity[3]	None/ ROB/10[10]	None/ ROB/7[10]	TL[5]/27	None/ ROB/1[10]	B-12[5]/1	None/ ROB/2[10]	B-12[5]/60	SWMB[6]/39	ROB[5]/7	ISO[5]/5	ROB[5]/31	
Int. Storage Config./ Location[4]	Stockpile or ROB[10]/ Plt. 9 Slab	Stockpile or ROB[10]/ Plt. 9 Slab	TL/ Plt. 1 Pad	Stockpile or ROB[10]/ Plt. 9 Slab	B-12/ Plt. 1 Pad	Stockpile or ROB[10]/ Plt. 9 Slab	B-12/ Plt. 1 Pad	SWMB/ Plt. 1 Pad	ROB/ Plt 1 Pad	ISO/ Plt 1 Pad	ROB/ Plt 1 Pad	
Disposition	to be determined	On-Property	Offsite: NTS	On-Property	PCDF[7]	On-Property	Offsite: NTS	Offsite: PCDF	On-Property	On-Property	On-Property	

(1) Excludes gutter cleanout which will be placed in drums (volume estimated at less than one drum).
(2) Excludes compactibles which will be placed in a dumpster as refuse for compaction. Miscellaneous materials can be containerized with Non-Regulated ACM.
(3) **TL**: Top-Loading (also referred to a Large Metal Box) holds 970 cubic feet and/or 18.0 tons of material; **ISO**: End-Loading Container/Sea-Land boxes) holds up to 971 cubic feet and/or 42,000 lbs. of material; **ROB**: Roll-Off Box holds 810 cubic feet and/or 16.95 tons of material; **B-12**: B-12 Box holds up to 44 cubic feet and/or 9,000 lbs. of material; and **SWMB**: Small White Metal Box holds approximately 80 cubic feet and/or 9,000 lbs. of material.
(4) Locations identified are based on current planning projections. Containerized accessible metals, inaccessible metals, painted light-gauge metals, and concrete from Bldgs. 64/65 are planned to be placed on the 64/65 slabs.
(5) Container is volume restricted.
(6) Container is weight restricted.
(7) PCDF: Permitted Commercial Disposal Facility.
(8) Volumes of concrete containing Tc-99 removed from Process Areas 2 and 4 in Building 9A are at- and below-grade quantities.
(9) Miscellaneous includes railroad tracks and pipe bridges.
(10) Accessible metals, inaccessible metals, painted light gauge metals, and concrete from Bldgs. 64 and 65 to be placed in ROBs unless no thorium contamination concerns.

Table 2-2 Unbulked Material Volume Estimates (ft^3)

Component Designation	Accessible Metals	Inaccessible Metals	Process-Related Metals	Painted Light-Gauge Metals	Lead Flashing	Concrete	Concrete Containing Tc-99	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. Materials	Component/ Complex Totals
9A	1,512	25,410	6,816	441	3	233	1,699	1,437	3,599	1,011	6,682	48,843
9B	33	852	92	4	0	81	0	0	161	46	524	1,793
9C	6	46	0	3	0	0	0	0	0	14	32	101
9D	18	112	0	0	0	0	0	0	221	10	300	711
9E	1	0	0	0	0	0	0	0	6	3	16	26
9F	4	65	3	3	0	0	0	0	12	15	48	150
32A	99	311	0	2	0	5,023	0	0	0	40	1,791	7,266
32B	17	19	0	0	0	0	0	0	0	3	293	332
64	197	1,423	0	106	3	1,200	0	0	25	0	1,489	4,443
65	269	640	0	72	2	0	0	0	0	0	789	1,772
69	156	401	28	17	0	5,625	0	959	0	116	1,513	8,815
78	239	4,333	418	49	0	8,160	0	0	0	0	2,480	15,680
81	81	376	0	40	0	0	0	0	0	0	120	617
Miscellaneous[1]	479	0	0	0	0	0	0	0	0	0	1,872	2,351
Complex Total	3,111	33,988	7,357	737	8	20,322	1,699	2,396	4,024	1,258	17,999	92,899

(1) Miscellaneous includes railroad tracks and pipe bridges.

Table 2-3 Material Weight Estimates (tons)

Component Designation	Accessible Metals	Inaccessible Metals	Process-Related Metals	Painted Light-Gauge Metals	Lead Flashing	Concrete	Concrete Containing Tc-99	Acid Brick	Non-Regulated ACM	Regulated ACM	Misc. Materials	Component/ Complex Totals
9A	370	604	116	103	1	6	154	116	201	2	40	1,713
9B	8	20	2	0	0	6	0	0	9	0	2	48
9C	2	4	0	1	0	0	0	0	0	0	0	6
9D	4	6	0	0	0	0	0	0	12	0	1	23
9E	0	0	0	0	0	0	0	0	0	0	0	1
9F	1	3	0	1	0	0	0	0	1	0	0	6
32A	24	14	0	1	0	138	0	0	0	0	22	202
32B	4	0	0	0	0	0	0	0	0	0	4	8
64	48	49	0	20	1	33	0	0	1	0	23	174
65	66	23	0	13	1	0	0	0	0	0	13	115
69	38	17	1	0	0	216	0	67	0	0	16	357
78	58	63	6	6	0	281	0	0	0	0	25	438
81	20	15	0	8	0	0	0	0	0	0	0	43
Miscellaneous[1]	117	0	0	0	0	0	0	0	0	0	6	123
Complex Total	760	818	125	153	3	680	154	183	224	2	152	3,254

(1) Miscellaneous components include railroad tracks and pipe bridges.

Compressed gases, explosives, free-liquids, fine particulates, hazardous wastes, corrosive materials and etiological agents will be containerized separately from debris. Sampling of waste containers designated for off-site shipments will be performed by FEMP waste management personnel in accordance with the OU3 RD/RA SAP (contained in Appendix D of the OU3 Integrated RD/RA Work Plan) and WAC of the receiving facilities.

Hazardous wastes will be taken once a day to either a designated satellite accumulation area (SAA) or an approved RCRA storage area for proper handling, treatment, and disposal as needed. Approved RCRA storage areas are identified in the FEMP Part B Permit Application. The subcontractor is required, pursuant to Specification Section 01120, to submit for DOE approval a work plan that identifies a proposed location of the SAA. The SAA, which will be controlled by FEMP personnel and managed in accordance with applicable RCRA requirements, will be established in locations which will ensure minimal disruption of construction activities.

Containers used for ACM will require additional preparation, including the use of polyethylene sheeting as secondary containment.

Full containers destined for off-site disposition will be delivered to an on-property packaging/staging area for sampling (if necessary), container inspection, and sealing. Materials destined for on-property temporary storage will be delivered directly to the designated interim storage area.

Pursuant to Specification 01120, waste materials that require movement outside to be containerized will be required to meet the decontamination requirements. If that requirement cannot be attained, the material may be encapsulated or wrapped in fiber reinforced sheeting and sealed prior to movement to prevent migration of contaminants during movement.

The Radiological Requirements Plan (RRP) outlines the requirements that must be met by the remediation subcontractor regarding radiological limits. The RRP is discussed in the OU3 Integrated RD/RA Work Plan, Section 3.2.5.

Interim Storage/Disposition

The strategy for interim storage of OU3 materials is described globally in the OU3 Integrated RD/RA Work Plan. Based on the latest projection for availability of interim storage space, it was determined that materials to be generated from the Thorium/Plant 9 Complex will be temporarily stored in three separate locations as identified in Table 2-1. For Categories A (accessible metals), B (inaccessible metals), D (painted light-gauge metals, not including lead sheeting), and E (concrete, not including surface concrete removed from Process Areas 2 and 4 of Building 9A), it is currently planned that those materials will be stockpiled in bulk on the Plant 9 slab. Calculations show that approximately 360,000 ft^3 of capacity will be available on the Plant 9 slab for debris stockpiling, assuming four stockpiles each having heights of 10 feet, while the combined bulk volume requirement for Categories A, B, D, and E from the selected structures equals approximately 150,000 ft^3. The strategy for interim storage of accessible metals, inaccessible metals, painted light-gauge metals, and concrete from Buildings 64 and 65, which are currently assumed to be potentially contaminated with thorium, is to place those containerized materials on the Building 64/65 pads. All other materials generated from the project will be containerized, as stated in Table 2-1, and placed on the Plant 1 Pad.

The duration for interim storage of materials to be placed in the On-Site Disposal Facility

(OSDF) depends on the OSDF material placement schedule. Materials generated that do not meet the OSDF waste acceptance criteria are expected to be dispositioned off-site within six months of generation.

The decision to use the Plant 9 slab for bulk storage of Categories A, B, D, and E debris has been made consistent with the authority and criteria established under Removal Action 17. Removal Action 17 criteria specifies the selection of debris storage locations in decreasing order of preferred usage: Plant 1 Pad, Plant 7 Slab, Plant 4 Slab, Plant 8 Slab, and slabs of dismantled buildings, and specifies the use of engineering controls to prevent potential contaminant releases. Similar to the preparation and use of slabs from Plant 7 and Plant 4 for interim storage of debris, all necessary engineering controls will be provided for the Plant 9 slab as required by Removal Action 17. Such engineering controls would include storm water runoff collection and treatment, as necessary, in the site wastewater treatment system. Since all bulk stockpiled debris will have met release criteria for exposure to the environment (release criteria reference: Part 3.1.A of Specification Section 01517), along with the fact that any materials that fail to meet that release criteria will be containerized and stored on the Plant 1 Pad, potential contaminant releases will be negligible. Prevention or minimization of contaminant releases are achieved by reduction of surface contamination on surfaces of debris using approved in situ decontamination methods. Additional treatment of debris would be employed (e.g., amended water spray on debris surfaces) in the event of suspected contaminant release.

Materials not identified for immediate off-site disposition will be placed in the queuing area by the remediation subcontractor to allow FEMP waste management personnel to inspect them prior to their relocation to the designated interim storage facility.

Material tracking and reporting will be accomplished through use of the Site-Wide Information and Tracking System (SWIFTS). Section 3.3.2.2 (Segregation, Containerization, Tracking) of the OU3 Integrated RD/RA Work Plan describes material tracking and reporting using SWIFTS. Project-specific material tracking and reporting strategies for the Thorium/Plant 9 Complex project do not differ from the strategies laid out in the OU3 Integrated RD/RA Work Plan and therefore no additional details were developed during the Thorium/Plant 9 Complex design. It should be noted that SWIFTS data on the Thorium/Plant 9 Complex at this time (i.e., prior to debris generation) are only *estimated* volumes and weights of the various OU3 categories. Those data are provided in Tables 2-1, 2-2, and 2-3 of the implementation plan. Actual volumes, weights, and interim storage locations for project materials will not be available until after they have been generated and are placed into interim storage, whereupon they will be reported to U.S. EPA in the project completion report for the Thorium/Plant 9 Complex.

Treatment and Disposition

The project-specific disposition strategy for materials generated during this project is consistent with the strategies presented in the OU3 Integrated RD/RA Work Plan Treatment and disposition decisions for project materials were made in accordance with the requirements stated in the OU3 Final Action ROD.

Table 2-1 identifies the disposition determination for project materials. Treatment will be required prior to the disposal of potential mixed waste acid brick and lead sheeting. Both materials are projected to be shipped to the Envirocare of Utah facility in Clive, Utah for treatment and burial. Accessible Metals (Category A) from the complex are currently being evaluated for potential recycling options. This evaluation will be performed using the

"Decision Methodology for Fernald Scrap Metal Disposition Alternatives", which is being developed by DOE-FN to specifically address evaluation of disposition alternatives. This evaluation is briefly described in Appendix B.

2.4 Environmental Monitoring

Project-specific environmental monitoring for the Thorium/Plant 9 Complex project includes wastewater monitoring and radiological air monitoring; groundwater monitoring is not applicable to this project but may be employed if necessary as described in Section 3.6.2.3 of the OU3 Integrated RD/RA Work Plan.

Project-specific stormwater management is governed by the FEMP Stormwater Pollution Prevention Plan (DOE 1996c) and any monitoring associated with that program is managed by the Aquifer Restoration Project. To ensure that the applicable performance requirements of that plan are followed during the Thorium/Plant 9 Complex project, Specification Section 01515 (Part 1.5.A.1.c of Rev. 0) requires that the subcontractor provide for FEMP approval the plans to be employed to control stormwater runoff, migration of washwater, and erosion control.

Project-specific reporting for wastewater and radiological air monitoring will be provided in the project completion report, which will include a summary of the results generated during the project. For wastewater, the report will include a summary of the results from sampling and analysis of decontamination washwater prior to its discharge into the FEMP wastewater treatment system (WWTS). For project-specific air monitoring, the report will be identify each of the air monitoring stations; the minimum, maximum, and average radiological activity readings at each of those locations; and the highest maximum value at site-wide ambient monitoring stations during the project period in relation to DOE Order 5400.5 limits.

Surface Water (Wastewater) Monitoring

The OU3 Integrated RD/RA Work Plan describes the strategies to be used for project monitoring of wastewater. Listed below are the specific references in the work plan:

- **Section 3.2.5 Surface Decontamination:** Wastewater collection and management strategies are discussed.
- **Section 3.3.3 Management of Secondary Waste:** The overall strategy for managing wastewater, as one of the primary aspects of secondary waste, through the site wastewater treatment system is discussed.
- **Section 3.5.2 Management of Contaminated Water:** References site procedure to be used for the evaluation and management of contaminated wastewater.
- **SAP/Section 2 General Sampling and Data Collection Approach:** The subsections in this section focuses on wastewater sampling, among other aspects of sampling.
- **SAP/Section 3 Specific Sampling Programs:** Sampling for disposition of wastes, including wastewater, is discussed. Determination of hazardous, radiological, and other waste characteristics is discussed.

The Thorium/Plant 9 Complex project is not expected to deviate from the strategies laid out

in the referenced documents and therefore no further detail is provided in this implementation plan.

Radiological Air Monitoring

Environmental radiological air monitoring during the Thorium/Plant 9 Complex decontamination and dismantlement project will consist of two programs: the Fernald Site Environmental Monitoring Program described in the site-wide Integrated Environmental Monitoring Plan (IEMP) (DOE 1997b), as discussed in Sections 3.5.1 and 3.6.2.1 of the draft OU3 RD/RA Integrated Work Plan, and the supplemental radiological air monitoring program specifically designed for this decontamination and dismantlement project to ensure adequate process control. An overview of the supplemental radiological program is provided in Section 3.6.2.1 of the OU3 Integrated RD/RA Work Plan while this implementation plan discusses the details of applying that program to this project.

Occupational monitoring of airborne radionuclides in the work areas will also be performed to ensure worker protection and will also serve as a real-time indicator of airborne radiological activity during decontamination and dismantlement; Section 8.1 of the OU3 Integrated Remedial Action Health and Safety Plan (Appendix E of the OU3 Integrated RD/RA Work Plan) describes occupational air monitoring program.

Computer modeling of potential emissions from the Thorium/Plant 9 Complex area was performed in January 1995 using the CAP88PC method to measure potential dose impacts from the project. CAP88PC is the personal computer version of the U.S. EPA model CAP88 that is the approved method for predicting emissions of radionuclides under the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) regulations. It should be emphasized that the CAP88 model is being used as a tool for assessing potential emissions from a project for the purpose of identifying potential mitigative controls and possibly the use of supplemental monitoring measures; it is not being used as a means to demonstrate compliance with NESHAPs Subpart H. The method to be used for demonstrating NESHAPs Subpart H compliance is presented in the IEMP as a collective sitewide strategy.

The CAP88PC modeling methodology is prescribed by the U.S. EPA reference manual: U.S. EPA User's Guide for CAP88, Version 1.0, 402-B-92-001. Computer modeling of potential emissions from the Thorium/Plant 9 Complex used radiological smear data to provide a more realistic measure than fixed contamination (identified through intrusive sampling results from the OU3 RI/FS database) of removable alpha, beta, and gamma contamination that could be released during dismantlement. The removable contamination data obtained through smear sampling represents a model input that depicts worst case emissions since it represents removable contamination present prior to the decontamination activities that will precede dismantlement.

The modeling methodology assumed no controls on emissions release, such as high efficiency particulate air (HEPA) filters on containment ventilation systems, and potential emissions sources were treated as being in readily dispersible forms. The results of the computer modeling indicate what the maximally exposed individual at the closest off-site receptor location would receive. The results of the computer modeling indicated that the maximally exposed individual would theoretically be located 956 meters north-northeast of the project area and would potentially receive a maximum Effective Dose Equivalent of 9.1×10^{-7} mrem/year from the D&D activities. Five optimal project emissions receptor locations were identified for supplemental air monitoring and are shown in Figure 2-1. The monitoring

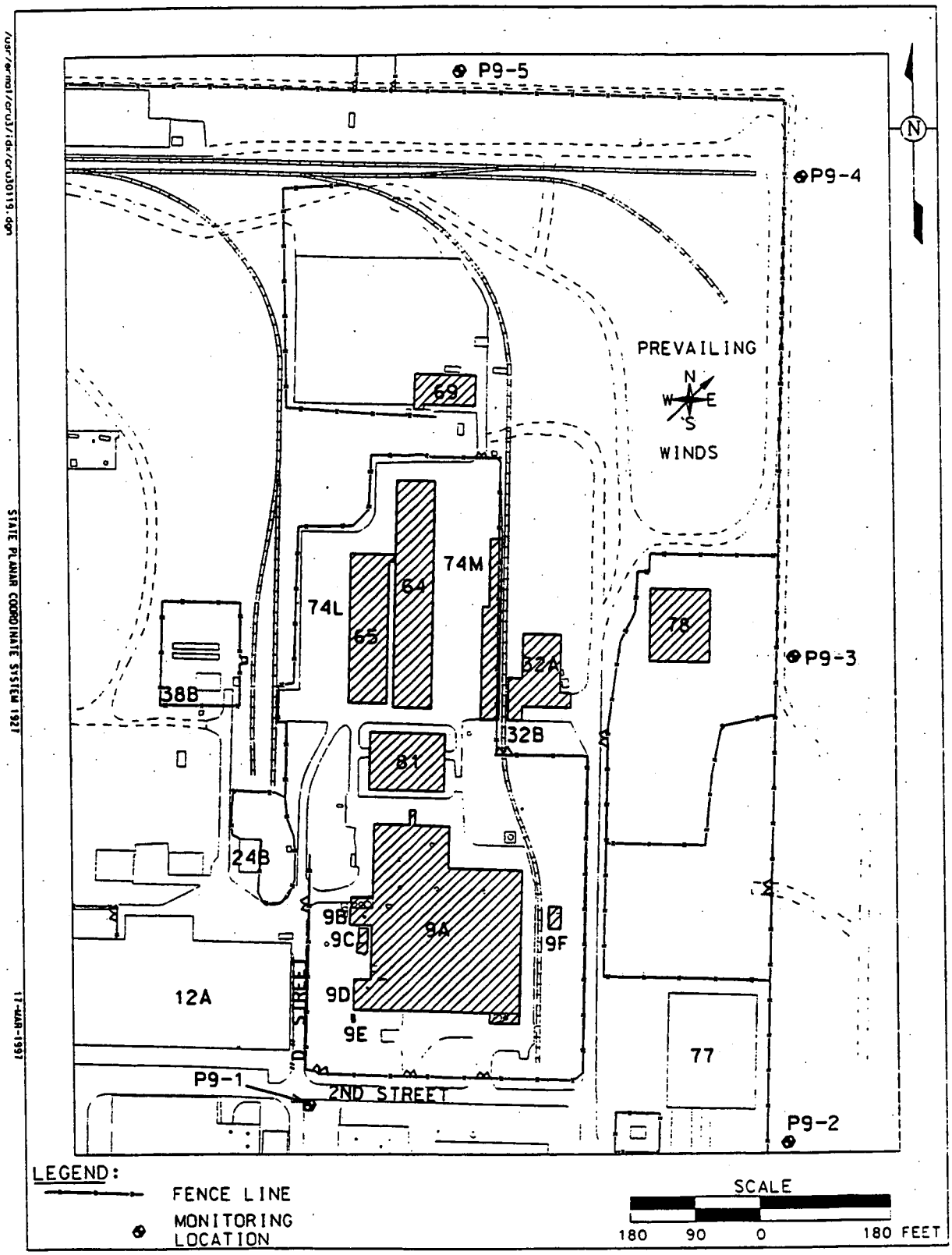


FIGURE 2-1 Proposed Air Monitoring Locations for Thorium/Plant 9 Complex

locations for the Thorium/Plant 9 Complex project were based on wind rose data and modeling of potential atmospheric releases. The most potentially impacted vectors were identified for the placement of monitors and the least affected vector was selected for the upwind monitor location. None of the vectors in the western sector of the Thorium/Plant 9 Complex showed significant impact, therefore no monitors were included in these locations. Considerations such as accessibility, availability of electrical power, and siting requirements were also evaluated in locating the monitors. Further justification for selecting only five monitors comes from analysis of data from Plant 7 (summarized in the "Plant 7 Dismantling - Removal Action No. 19, Final Report", May 1995), Plant 4 (summarized in the "Project Completion Report, Building 4A Complex", draft January 1997), and Plant 1 Complex - Phase I (to be summarized in the Project Completion Report for that project, although it has been reviewed internally as it has been collected during the implementation of the project) decontamination and dismantlement projects, which have shown that dismantlement activities resulted in negligible airborne radiological contaminant emissions. Results for airborne uranium contamination during those projects have been approximately 5 percent of the DOE maximum off-site guidelines of 0.1 pCi/m^3. The relationship between pCi/year and mrem/year may be understood by the conversion factor used to equate the two terms at the FEMP: if inhaled continuously (24 hours/day, 365 days/year), 0.1 pCi/m^3 of uranium in air will result in a dose of 100 mrem/year. It should be noted that various assumptions have been incorporated into this conversion factor.

Process knowledge and engineering evaluations have shown that total uranium is the primary radionuclide of concern for this project. Monitoring of potential airborne uranium will include collection of total suspended particulates using high-volume air samplers at the locations referenced above. Sampling will be performed 24 hours/day, 7 days/week, beginning four to six weeks prior to commencement of interior debris removal or equipment removal tasks to establish a background or baseline level and continue until Completion of Field Activities (milestone referenced in Section 4). The period of four to six weeks for background sampling has been determined based on previous and ongoing OU3 projects, to be sufficient for establishing a representative background. Samples for preliminary background monitoring and dismantlement monitoring will be collected once a week. Environmental radiological air monitoring procedures are provided in Appendix K of the Sitewide CERCLA Quality Assurance Project Plan (SCQ).

Data from each building will be continually evaluated to ensure that no additional parameters are necessary from an environmental standpoint. Upon turnover of Buildings 64 and 65 for decontamination and dismantlement, following completion of the Thorium Overpacking Project, radiological assessments will be done on component surfaces to determine if potential thorium emissions are also a concern. Should thorium represent a potential environmental air emissions concern, the project-specific air monitoring program will be modified to provide the appropriate level of process feedback.

For air monitoring to be useful in the evaluation of engineering controls, results from air monitoring will be reported to the construction manager as expeditiously as possible. In consideration of requisite decay periods for samples and time needed to perform analytical and reporting tasks, it is anticipated that the preliminary results of sampling would be delivered to the OU3 Project Manager in no less than seven calendar days from the date that the sample is taken. Preliminary results will provide the data, albeit not validated at that point, needed to evaluate project concentrations against the baseline concentration. If radiological levels from four consecutive weeks of air monitoring are more than twice the maximum baseline

levels, then FEMP Project Management will be notified of initial trending of values above baseline. The evaluation of the effectiveness of engineering controls following exceedance of the criteria (i.e., twice the maximum baseline for four consecutive weeks) will be performed immediately or as soon as practicable.

Four consecutive weeks of positive trending accounts for any anomalies that may be occurring over time. Given the low concentrations observed during previous OU3 projects, any data point greater than twice the maximum baseline values is conservative enough to allow for an engineering evaluation prior to meeting or exceeding the project self-imposed action threshold of 0.1 mrem/year. The engineering evaluation will be used to determine the effectiveness of engineering controls during remediation and to identify any need for additional mitigative measures. Monitoring data will be validated in accordance with the SCQ requirements, compiled as it becomes available, and used to trend sample results and to further evaluate the effectiveness of engineering controls and any need for mitigative measures.

Additional mitigative measures that might be employed in the event of exceeding the criterion stated above would include an increase in engineering and administrative controls during a particular operation that has been identified as the cause, or probable cause, of the elevated radiological levels. Such controls could include an increase in negative pressure within the enclosed work area using additional HEPA filtration units or additional surface cleaning (wash) steps before removing material from the containment.

2.5 Remediation Activities

A general approach to the above-grade decontamination and dismantlement of the Thorium/Plant 9 Complex is described in the following subsections. Section 3 elaborates on this discussion by identifying component-specific interests concerning the six remedial tasks, as applicable. The six tasks are as follows:

- Preparatory Action: Inventory Removal;
- Preparatory Action: Safe Shutdown;
- Hazardous Waste Management Unit decontamination;
- Asbestos Removal;
- Surface Decontamination; and
- Above-Grade Dismantlement.

Although the six remedial tasks are generally described in the order in which they will be performed, the actual order for performing these activities may differ from the sequence presented in this plan as a result of evaluation and selection of alternate methods by the remediation subcontractor as approved by the OU3 Project Manager.

As required by Specification 01515 (Mobilization), the following activities will take place prior to the implementation of remediation activities discussed in Section 3. OU3 Project Management, using the FEMP workforce, will establish a break room, clean room, and shower facilities. The remediation subcontractor will mobilize in preparation for the decontamination and dismantlement activities by establishing a material handling and containerization area, access and egress roadways to and from the job site, and the construction zone boundary. The proposed construction zone boundary is delineated in Figure 1-1. The remediation subcontractor will also deliver equipment, materials, and office and storage trailers to the site as necessary to perform remediation activities. All equipment will be inspected by OU3

Project Management and surveyed by radiological control technicians to ensure that no contamination or items prohibited by the FEMP are brought on-site. A sign-in station will be established at the entrance to the job site for posting of permits and health and safety plans. Additional radiological control boundaries will be established prior to starting remediation activities in order to locate contaminated material staging areas as well as access and egress points to and from contaminated areas.

Additionally, the remediation subcontractor is required to develop and submit work plans covering every aspect of the project. One such plan provides details relative to how the remediation subcontractor will protect adjacent facilities (Specification 01515). Other plans are required for controlling fugitive emissions (Specification 15067), storm water run-off protection (Specification 01515), and controlling erosion (Specification 01515). Throughout the remediation activities, the remediation subcontractor will be responsible for notifying OU3 Project Management of conditions in the field that require environmental response. All conditions that necessitate a response will be dealt with immediately.

2.5.1 Preparatory Action: Inventory Removal

Existing waste/product inventories from components will be removed by FEMP personnel prior to decontamination and dismantlement operations and transported to interim storage facilities or off-site disposal facilities under the decisions and procedures adopted from Removal Action No. 9. Section 3 provides volume estimates of containerized materials that were removed during Removal No. 9. Inventory removal was completed for all components except Components 64, 65, and 81 due to the ongoing Thorium Overpacking Project operation (64 and 65) and use as a RCRA storage facility (81). Each of these remaining facilities will undergo inventory removal before OU3 remediation begins in these structures. The volumes of material removed during these preparatory activities will be included in the Project Completion Report.

2.5.2 Preparatory Action: Safe Shutdown

Safe shutdown activities were completed in Buildings 9A through 9F on February 5, 1996. These activities were performed by FEMP personnel under Removal Action No. 12. Safe shutdown activities consisted of:

- removal of all salvageable equipment;
- removal of loose, gross contamination;
- removal of hold-up material;
- general clean-up; and
- disconnection of all utilities.

Various types and quantities of hold-up materials were removed from Building 9A during safe shutdown. The purpose of hold-up material removal was to reduce potential hazards from the work environment for the remediation subcontractor; to provide FEMP Health and Safety and Waste Management organizations with known starting conditions that are needed to develop the Safety Analysis, work permits, and Health and Safety Plan for remediation activities; and to aid in determining disposition options for the remediation materials. All systems were inspected to ensure such material was removed and any previously undetected material is located, quantified, and removed. Inspection techniques included visual inspection and/or non-destructive analysis.

A general cleaning operation was performed to remove visible dust and loose debris (including pigeon debris) from building surfaces, walls, and floors. The purpose of this activity was to remove loose radiological contamination held within the dust as well as other hazards (e.g., biological and chemical), thereby reducing the potential personnel exposure during D&D remediation activities. Building openings that allow animal access have been sealed to ensure no further intrusion from animals and to minimize the potential migration of loose contamination to the environment.

All steam, potable water, electrical power, fire protection systems, compressed air, communication systems, and radiation detection alarms have been de-energized and terminated at the equipment or at the building exterior to establish the known condition of each energy source within the remediation area. The fire alarm and radiation detection alarm systems have been re-routed and activated.

In addition to Safe Shutdown of Buildings 9A through 9F, other buildings located in the Thorium/Plant 9 Complex will undergo preparatory actions under a "Facility Shutdown" program. The Facility Shutdown program, which is discussed in Section 3.2.2 of the OU3 Integrated RD/RA Work Plan, employs preparatory actions similar to Safe Shutdown, but for non-process facilities.

2.5.3 Hazardous Waste Management Units

The remedial design for the Thorium/Plant 9 Complex included the assessment of potential contaminants in HWMU No. 35 which is the only HWMU in the complex. HWMU No. 35 — Plant 9 Warehouse (Building 81) will be remediated under the RCRA/CERCLA integrated process which was described in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan. Remediation requirements for HWMU No. 35 are specified in Section 3.13 of this implementation plan as a component-specific remediation task for Building 81.

Certification of HWMU remediation will be included in the project completion report for above-grade decontamination and dismantlement, which is discussed in Section 4.0 of this implementation plan.

2.5.4 Asbestos Removal

The removal of ACM from components will be conducted by a remediation subcontractor qualified to conduct asbestos abatement operations. This activity will involve removing all friable types of asbestos, typically consisting of thermal system insulation (TSI) on pipes and equipment. ACM removal strategies to be applied to this project were discussed in depth in Section 3.2.4 of the OU3 Integrated RD/RA Work Plan. The project specific requirements for ACM removal are specified in Specification 01516.

2.5.5 Surface Decontamination

If the building/component radiological survey results do not meet the criteria defined in Part 8 of the bid document, interior surface decontamination will be performed prior to removal of the exterior structural skin/materials to prepare the component for exposure to the environment and structural dismantlement. The surface decontamination strategies described in Section 3.2.5 of the OU3 Integrated RD/RA Work Plan will be applied to the project. The project specific applications of those strategies are provided in Specification 01517, which is included in Appendix B of that work plan.

2.5.6 Above-Grade Dismantlement

Above-grade dismantlement activities to be performed during the Thorium/Plant 9 Complex remediation include all of the activities described in Section 3.2.6 of the OU3 Integrated RD/RA Work Plan. Project specifications prepared for above-grade dismantlement include the following:

1) Bulk Removal - includes removal of electrical components, piping, construction debris, and heating, ventilation and air conditioning (HVAC) systems (Specification 15066);

2) Interior and Exterior Equipment Removal - (Specification 15065);

3) Interior and Exterior Transite Panel Removal - (Specification 07415);

4) Structural Steel Removal - (Specification 05126); and

5) Concrete Removal - (Specification 03315).

Other activities that support this remedial task include lifting and rigging (Specification 14955) and ventilation and containment (Specification 15067).

A general discussion of above-grade dismantlement tasks are described below. The building-specific above-grade dismantlement tasks are discussed in Section 3.

Bulk Removal

Prior to breaching any system, the remediation subcontractor and OU3 Project Management will verify that all the systems are de-energized.

All piping, valves, electrical components, conduit, wire, cable trays, construction debris, and HVAC systems will be removed and reduced in size. During removal of piping, pumps, and HVAC ductwork, internal surfaces will be visually inspected to ensure the absence of free liquids or solid materials. If free liquids or solid materials are found, an evaluation will be initiated by the OU3 Project Manager to determine the requirements for material handling and removal (Specification 15066). The evaluation will identify the contents and requirements for containerization, storage, and disposal. If the item fails visual inspection, it shall be considered to be "process related debris" and disposed appropriately, as described in Specification 01120 and the Waste Management Plan.

Methods such as reciprocating saws, portable band saws, and shears are the preferred methods for bulk removal. Methods that volatilize the paint and contamination can be used, provided that additional safety and health requirements for worker protection are met. These methods include the use of respiratory protection and portable air cleaning units. Periodic radiological surveys will be performed to ensure that the potential for airborne radioactivity is minimized and to reduce the potential for cross-contamination. Surface wiping or vacuuming may be required to minimize transferrable contamination.

Equipment Removal

Equipment within the Thorium/Plant 9 Complex has been identified and classified based on size and disposition requirements. As equipment is removed, the internal building surfaces and floor area previously covered by the equipment will be visually inspected to ensure the absence of free liquids or solids. If these materials are found, an evaluation will be initiated by OU3 Project Management to determine the appropriate removal and handling requirements for the material (Specification 15065).

Based on the equipment to be removed and the requirements for removal as specified by Specification 15065, the remediation subcontractor is required to submit for approval a detailed work plan including the sequence, methods of removal and dismantlement, equipment required, catalog cut sheets, drawings and method and materials to control possible generation of airborne contaminants from cutting operations, etc. Staging of removed equipment and size reduction will be proposed by the remediation subcontractor and approved by DOE.

When the building is opened, the equipment will be placed into a container inside the building, if possible, or removed from the building and placed into a container for off-site transport. Depending on the size and configuration of the equipment, a rigging plan may be necessary prior to removal.

Interior Panel Removal

Transite Panel Removal: Prior to removing the transite panels, a coating of amended water will be applied to lock down any loose fibers. A screw gun is the preferred method for removing the panels. If the fasteners cannot be removed with a screw gun, then the area around the fastener will be sprayed with a fixative allowing the fastener to be pried out. Prior to any fixation, Specification 07415 requires the remediation subcontractor to demonstrate the proposed method to be utilized. After the screw is pried out, the fixative will be reapplied. If a broken panel is encountered, then the area around the break will be sprayed with amended water or encapsulated with the fixative. HEPA vacuums will be available to collect any loose material. The batt insulation will be removed and containerized. As the insulation is removed, a visual inspection and a radiological survey will be performed on the newly exposed surfaces. Indications of friable asbestos will require gathering the loose material and locking the remaining fibers in place. If radiological survey results indicate the need to perform decontamination or lock down of the areas to levels consistent with surrounding building surfaces, then these activities will be performed. Fasteners and molding that hold the panels and insulation in place will also be removed as part of this operation.

Metal Panel Removal: Screw guns are the preferred method for removing the metal panels. Optional methods of drilling or prying the fastener out may also be used to remove the panels. As the panels are removed, a radiological survey will be performed on the newly exposed surfaces to ensure contamination levels are within the established guidelines. Surface decontamination may be performed to reduce contamination levels as required.

Exterior Panel Removal

Transite Panel Removal: Specification 07415 specifies that the remediation subcontractor shall maintain the integrity of the exterior of the building until the transite and insulation have been removed and encapsulant, lock-down, or surfactant has been applied to the interior surface of exterior panels. A screw gun is the preferred method for removing the panels. If the fasteners cannot be removed with a screw gun, the area around the fastener will be sprayed with a fixative, thus allowing the fastener to be pried out. As with interior transite,

prior to any fixation, Specification 07415 requires the remediation subcontractor to demonstrate the proposed method to be utilized. After the screw is pried out, the fixative will be reapplied. If a broken panel is encountered, the area surrounding the break will be sprayed with amended water and the fragmented pieces will be encapsulated with a fixative. HEPA vacuums will be available to collect any loose material.

A wall climbing device is the preferred method for removing the wall panels thus allowing the panels to be removed and stacked on the wall climber for transport to the ground level.

Metal Panel Removal: Screw guns are the preferred method for removing the metal panels. Optional methods of drilling out the fastener or prying the fastener out may also be used to remove the panels. As the panels are removed, a radiological survey will be performed on the newly exposed surfaces to ensure contamination levels are with the established guidelines. Louvers, gutters, downspouts, and flashing will be removed as they are encountered.

Structural Steel Removal

In order to prepare the component for structural steel removal, all remaining items, such as non-load bearing steel members, windows and frames, doors, gutters and down spouts, will be removed using mechanical means. As these items are removed, the exposed component surfaces have the potential of holding debris and contamination. These areas will be visually inspected to determine if these surfaces meet the decontamination requirements of Specification 01517. Additional decontamination such as encapsulation of surfaces may be performed as discussed in Section 2.5.5 of this Implementation Plan.

Hydraulic shears or oxy-acetylene torches may be used to dismantle and size reduce the structural steel frame. The component-specific dismantlement techniques are presented in Section 3 of this document. Prior to and during dismantlement, the area surrounding the structure will be sprayed with amended water to reduce fugitive dust emissions. This water will be controlled and dispositioned to the storm sewer.

The remediation subcontractor will be required, pursuant to Specification 05126, to specify in a structural steel removal work plan the following methods:

- detailed sequence of dismantlement, including equipment;
- methods for contamination control, including fugitive emissions during size reduction;
- methods for cutting/size reduction, including equipment to be used;
- plans for protecting lay down and cutting areas from lead paint chips;
- methods and materials to be used for cutting lead painted steel; and
- calculations to verify structural integrity of partially dismantled structure, as applicable;
- calculations to verify structural integrity of roof to support personnel who may be required there;

- detailed work plan describing personnel tie-offs, pick boards, and walking on or near roof pearlings. All calculations shall be stamped by a Registered Professional Engineer.

Material size reduction requirements for the Thorium/Plant 9 Complex project are specified in the MSCC located in Part 6 of the bid document.

Specification 05126 provides direction to the remediation subcontractor in several other ways relative to the removal of structural steel. It reemphasizes the remediation subcontractor's responsibility for avoiding damage to adjacent structures, material, and equipment during dismantlement activities, and, it specifies that lead-based paint chips and debris, released during structural steel dismantlement, shall be collected and managed in accordance with Specification 01120.

Concrete Masonry Unit (CMU) Secondary Containment and Pedestal Removal

Specification 03315 requires the remediation subcontractor to develop a concrete removal work plan containing information quite similar to that of the structural steel removal work plan discussed above. The CMU secondary containments and pedestals will be radiologically surveyed prior to removal to determine the need for engineering controls, such as an enclosure with ventilation or water sprays to minimize fugitive dust, during removal operations.

Except for the removal (at least the top one inch) of concrete in two process areas of Building 9A, the base slabs of the structures will remain in place during this remedial action. Specification 01515 addresses requirements relative to the preparation of the base slab during demobilization. Specifically, all openings in the slab will be filled with granular material and grout to provide a flat uniform surface thus minimizing the chance for water accumulation and migration, and potential safety hazards. All wire and cable will be cut away to grade level from the conduit embedded in the concrete. Conduit and other slab obstructions will be cut away to grade level, plugged, and covered with grout to grade level for positive drainage.

3.0 COMPONENT-SPECIFIC REMEDIATION

This section presents component-specific remediation tasks identified for the Thorium/Plant 9 Complex decontamination and dismantlement project. Background information provided in this section was obtained primarily from the OU3 RI/FS WPA (DOE 1993) and remediation subcontract SOW, including figures showing notable features of the building. Information regarding the remediation approach was obtained from the remediation subcontract SOW, performance specifications, the OU3 Integrated RD/RA Work Plan.

3.1 Building 9A - Special Products Plant

Background

Building 9A (Special Products Plant) is a single-level, irregularly-shaped building with a small penthouse on the roof. It is located on the northeast corner of 2nd Street and 'D' Street, with approximate dimensions of 200 ft. x 260 ft. x 20 ft. The building consists of a structural steel frame with transite siding and roofing panels, some built-up roofing, and a poured-concrete foundation and slab on grade. The floor plan for Building 9A is shown in Figure D-3 of Appendix D. Elevation views are shown in Figures D-4 through D-6. Figures E-2 through E-12 are copies of photographs that show several ground-level views of Building 9A and process equipment contained within the building.

Building 9A contains nine historical process areas. The primary purposes of the plant were uranium reduction, uranium casting, and the following support processes: chip briquetting, scrap metal pickling, derby cleaning, Zirnlo decladding, and the production, machining, and heat treatment of uranium ingots. Each process is discussed below.

Process Area 1 - Uranium Reduction and Derby Cleaning. These two processes used similar equipment and occurred in the same area.

Uranium Reduction. Originally, milled dolomite was used as a pot liner for the uranium reduction process. Later, MgF_2 (a reaction by-product) was used to line the reduction pots. Liners were formed inside jolters, then filled with a blend of UF_4 and Mg, lidded, and furnaced. The uranium produced from the reduction reaction was cooled and separated from the MgF_2 and dolomite. The uranium reduction area currently contains three jolters, six liner hoppers, one pot filling/blending machine, one capping and lidding station, 13 reduction furnaces, cooling tanks, and one breakout booth.

Derby Cleaning. The uranium derbies were cleaned with a molten salt treatment that consisted of a 50/50 blend of lithium carbonate (Li_2CO_3) and potassium carbonate (K_2CO_3). The treatment removed any MgF_2 that adhered to the derbies. The operation was conducted in resistance element furnaces originally used for uranium reduction. Currently, eight Rockwell resistance element furnaces are in the area.

Process Area 2 - Enriched Uranium Casting. Enriched uranium derbies and recycle metal were remelted to cast 11- and 13-inch diameter ingots for further processing. Graphite crucibles and zirconia-coated graphite molds were used in the induction-heated vacuum NPR furnaces. After pouring an ingot, crucibles were inverted and subjected to flame oxidation to "burn out" residual uranium. Ingots were cooled and separated from the molds and sent for machining. Molds were cleaned and re-coated in Building 9A. Equipment in the area includes two induction furnaces, dust collection equipment, a vacuum system, and an oil reclaimer.

Process Area 3 - Zirnlo Decladding. The Zirnlo decladding process operated from 1963 to 1988, and was used for decladding nonirradiated fuel cores of copper and zirconium or nickel and aluminum cladding. Cores were sawed to size and placed sequentially in oxidizing and then reducing baths to remove the clad layers. Equipment in the area includes a reciprocating saw, open tanks, and holding tanks.

Process Area 4 - Uranium Machining. A variety of machining processes for uranium ingots were performed in Process Area 4, including top cropping, outer diameter turning, hole boring, and chamfering. Equipment includes saws, lathes, drills, and milling machines.

Process Area 5 - Triple Beta Heat Treating. Uranium ingots produced in Building 9A were beta heat treated in NuSal salt in an ingot heat-treating furnace. Originally, the ingots were beta heat treated three times, but later the treatment was a one-step process. The Building 9A ingot heat-treating furnace has been removed.

Process Area 6 - Scrap Metal Pickling. A nitric acid bath was used to remove surface oxidation from metal to be used for remelt feed. The pickling area currently contains a nitric acid tank, a rinse tank, and a fume scrubber.

Process Area 7 - Briquetting. Uranium chips from Building 9A machining were dumped into a crusher, put into baskets, centrifuged, and then bathed in nitric acid to remove oxides. The chips were then rinsed twice with water, centrifuged, and briquetted in a press. The nitric acid tank, two water rinse tanks, two centrifuges, chip crusher, briquette press, and fume scrubber have all been removed.

Process Area 8 - Internal and External Remelt Furnaces. All equipment has been removed from the internal and external remelt furnace area. Equipment included four vacuum induction furnaces, two vacuum pumps, a crucible "burnout" station, pot charging and mold cleaning stations, a separation booth, and an oil reclaimer.

Process Area 9 - Thorium Metal. Thorium was dissolved in nitric acid and precipitated as ThF_4 with HF. The ThF_4 was then dried, pulverized, blended with calcium and zinc chloride, and thermally reduced to a zinc-thorium derby. The derby was subsequently dezinced and remelted in a vacuum furnace. Turnings from machining the thorium to a final form were acid washed and briquetted for return to the remelt cycle. The thorium metal process was performed during 1954 and 1955, and all equipment has been removed.

Building 9A has undergone or will undergo each of the remedial tasks discussed in Section 2.5 except for HWMU decontamination since this facility does not house a HWMU. Preparatory activities completed in building 9A are summarized below. Surface Decontamination will be performed concurrent with and following material removal but is not discussed in this section since there are no component-specific details beyond what is already provided in Section 2.5.5.

<u>Preparatory Action: Inventory Removal</u>

Table 3-1 shows the storage quantities of containerized material that were removed from Building 9A as part of the inventory removal activity.

<u>Preparatory Action: Safe Shutdown</u>

Safe shutdown activities include the removal of all hold-up material within the equipment,

piping and ductwork systems. Table 3-2 lists the quantities of hold-up material removed from Building 9A during Safe Shutdown. All systems have been inspected to ensure that these quantities were removed.

TABLE 3-1 Building 9A Inventory Removal

No. of Drums	Description of Material
1	Discard Process Residues
5	Non-Recoverable Trash - For Storage or Shipment
1	Contaminated Soil, Rocks, Sand, Bricks, and Ceramics
1	Contaminated Asbestos Materials

TABLE 3-2 Building 9A Hold-up Material

Process Area	Process Area Description	Estimated Hold-up Volume (ft^3)
1	Uranium Reduction and Derby Clean	32
2	Enriched Uranium Casting	28
3	Zirnlo Cladding	31
4	Uranium machining	286

Asbestos Removal

Individual asbestos work areas will be established within Building 9A. Most of the ACM is in good condition and has not caused any building areas to be designated as asbestos areas because of the concern for friable asbestos. The individual work areas will minimize the amount of area required to be released from asbestos concerns.

The ACM from the equipment, the interior walls, and from areas that have the potential to be disturbed during bulk removal and equipment removal operations will also be removed. If damaged ACM is encountered during removal activities, then an aggressive air sampling test will be performed to confirm the absence of asbestos fibers. If the asbestos fiber count is elevated, then a lockdown, encapsulant and/or surfactant will be applied to the surfaces to lock down the loose fibers. An additional air sampling test will then be performed to verify the lock down effectiveness.

A final asbestos removal effort will take place subsequent to the completion of the bulk removal and equipment removal operations. The equipment removal will allow for unobstructed movement around the building, simplifying the remaining asbestos removal activities. Approximately 2,996 lineal ft. of pipe insulation will be removed as part of the asbestos removal activity. Approximately 712 ft^2 of asbestos-containing floor tile and associated mastic will be removed.

Surface Decontamination

In accordance with Specification 01518 (Surface Removal of Concrete), at least the top one inch of concrete from Process Areas 2 and 4 in Building 9A will be removed using a method that is approved by DOE. The remediation subcontractor will be required to provide a system with all necessary equipment for concrete removal, dust control, containerization and transport of the produced waste. No wetting shall be allowed during the removal process. The system shall include a pre- and HEPA filtering system to maintain dust and contaminants below limits established in the Radiological Requirements Plan.

Although the remediation subcontractor is encouraged to investigate all technologies to determine a Best Available Technology, the concrete removal system known as Pentek Moose, Squirrel and Corner-Cutter scabblers is acceptable. Acceptable performance of concrete removal will be achieved when at least one inch of surface has been removed from the entire floor areas of Process Areas 2 and 4. Method of verification that one inch of surface concrete has been removed will be proposed by the remediation subcontractor and approved by DOE.

Above-Grade Dismantlement

Building 9A dismantlement will consist of removing the building contents and structure that were described above. Materials to be removed will include piping and conduit; HVAC ductwork and ductwork insulation; equipment (the types of equipment contained in Building 9A are identified in the background discussions at the beginning of this section); structural and miscellaneous steel; concrete masonry unit (CMU) block; roofing material; doors and windows; interior transite paneling; and, batting insulation and exterior transite.

3.2 Building 9B - Plant 9 Sump Treatment Facility

Background

Building 9B - Plant 9 Sump Treatment Facility is a single-level building measuring approximately 20 ft. x 30 ft. x 20 ft. Building 9B adjoins the west side of the Special Products Plant (Building 9A) and consists of a structural steel frame on a poured concrete base and floor with transite walls and roofing. The floor plan of Building 9B is shown in Figure D-7 of Appendix D. Figures E-13 and E-14 of Appendix E are copies of photographs showing the exterior elevation and the interior of Building 9B.

Building 9B treated wastewater from the Special Products Plant, originally with ammonium hydroxide (NH_4OH) and later with lime, to remove the bulk of the contaminants before wastewater transfer to the General Sump (Component 18B). Currently, the equipment remaining in Building 9B includes a decant tank, an acid tank, a mix tank, two plate and frame filters, and three filtrate tanks. A single process area has been identified for Building 9B.

Asbestos Removal

Individual asbestos work areas will be established within Building 9B. Most of the ACM is in good condition and has not caused any building areas to be designated as asbestos areas because of the concern for friable asbestos. Approximately 365 lineal ft. of pipe insulation will be removed as part of the asbestos removal activity. Additional information on asbestos removal requirements that apply to Building 9B can be obtained in Sections 2.5.4 and 3.1.

Above-Grade Dismantlement

Building 9B is constructed of transite panel walls and transite panel roofing on a poured reinforced concrete base. The supporting frame is constructed of structural steel. Materials

generated during the dismantlement of Building 9B will include piping and conduit; equipment; structural and miscellaneous steel; roofing material; doors and windows; interior transite paneling; batting insulation; and, exterior transite.

3.3 Component 9C - Plant 9 Dust Collector

Background

Component 9C (Plant 9 Dust Collector) adjoins the west side of the Special Products Plant (Building 9A), and measures approximately 20 ft. x 35 ft. x 25 ft. The component consists of a steel dust collector housing mounted on a poured concrete base and pad. The floor plan for Component 9C is shown in Figure D-7 of Appendix D. Figure E-15 in Appendix E is a copy of a photograph of the west elevation of Component 9C.

One process area has been identified for Component 9C. The component contains the dust collector (G42-615), a Hoffman vacuum pump, and two cyclones. The dust collector was used to filter exhausts from the Special Products Plant reduction process.

Asbestos Removal

Individual asbestos work areas will be established within Component 9C. Most of the ACM is in good condition and has not caused any areas to be designated as asbestos areas because of the concern for friable asbestos. Approximately 16 lineal ft. of pipe insulation will be removed as part of the asbestos removal activity. Additional information on asbestos removal can be obtained in Sections 2.5.4 and 3.1.

Above-Grade Dismantlement

Above-grade dismantlement of Component 9C will consist of removal of the dust collection system components, piping, conduit and ductwork. Materials resulting from dismantlement will include piping and conduit; structural and miscellaneous steel; and HVAC ductwork and ductwork insulation.

3.4 Building 9D - Plant 9 Electrical Substation

Background

Building 9D (Plant 9 Electrical Substation) is a single-story building which adjoins the Special Products Plant (Building 9A), and measures approximately 16 ft. x 30 ft. x 30 ft. The building consists of a structural steel frame on a poured concrete base and floor with transite roofing and siding. The floor plan of Building 9D is shown in Figure D-8 of Appendix D. Figure E-16 in Appendix E is a copy of a photograph of the northwest elevation of Building 9D.

Above-Grade Dismantlement

Dismantlement of Building 9D will materials consisting of piping and conduit; structural and miscellaneous steel; roofing material; doors and windows; interior transite paneling; batting insulation; and, exterior transite.

3.5 Building 9E - Plant 9 Cylinder Shed

Background

Building 9E (Plant 9 Cylinder Shed) is a single-story structure located to the northeast of the 2nd Street and "D" Street intersection. The shed is a three-sided, steel-framed structure with transite siding and a concrete floor. The approximate dimensions of Building 9E are 5 ft. x 10

ft. x 8 ft. An isometric view and detail plans of the building are shown in Figure D-9 of Appendix D.

Building 9E was utilized to store pressurized gas cylinders that were required for operations within the Special Products Plant. The storage shed currently contains empty cylinder storage racks.

Above-Grade Dismantlement
Materials generated during the dismantlement of Building 9E will include structural and miscellaneous steel; roofing material; and exterior transite.

3.6 Building 9F - Plant 9 Electrostatic Precipitator

Background
Building 9F (Plant 9 Electrostatic Precipitator) measures approximately 20 ft. x 35 ft. x 25 ft. The component is located on the east side of the special products plant and consists of a structural steel frame with corrugated steel siding and roofing on a poured concrete base and floor. Figure E-17 in Appendix E is a copy of a photograph of the component's southwest elevation view.

Building 9F currently contains the electrostatic precipitator (precipitron) and filters that handled exhausts from vented machining equipment in Building 9A. The electrostatic elements were not electrically powered because of moisture contained in the exhausts.

Asbestos Removal
Individual asbestos work areas will be established within Building 9F. Most of the ACM is in good condition and has not caused any areas to be designated as asbestos areas because of the concern for friable asbestos. Approximately 92 lineal ft. of pipe insulation will be removed as part of the asbestos removal activity. Additional information on asbestos removal can be obtained in Sections 2.5.4 and 3.1.

Above-Grade Dismantlement
Dismantlement of Building 9F will include the removal of piping and conduit/wire; equipment; structural and miscellaneous steel; roofing material; doors and windows; and, exterior transite.

3.7 Building 32A - Magnesium Storage Building

Background
Building 32A (Magnesium Storage Building) is a single-level building located directly northeast of the Plant 9 Warehouse (Building 81), with approximate dimensions of 52 ft. x 103 ft. x 17 ft. The building consists of a cinder block wall and reinforced concrete floor construction. Figures D-13 and D-14 of Appendix D show the floor plan and various elevation views of Building 32A. Figures E-21 through E-24 of Appendix E are copies of photographs of elevation views and the interior of Building 32A.

The Magnesium Storage Building housed drummed or bagged magnesium metal turnings utilized in the reduction process in the Metals Production Plant (Building 5A). The building is currently being used for the storage of excess equipment from the CP Storage Warehouse (Building 56A), including computers, office furniture, and miscellaneous equipment.

Safe Shutdown

While there are no hold-up materials in Building 32A, there is a requirement that the facility be placed in a safe and controlled configuration prior to dismantlement. As described in Section 3.2.2 of the OU3 Integrated RD/RA Work Plan, the controlled shutdown, or "facility shutdown", of non-process facilities, will be referred to as safe shutdown.

Safe shutdown of Building 32A will de-energize the support services to the building (electrical, water, etc.) and remove the office equipment currently stored there. Since these are not hazardous materials or wastes, estimates of their volumes are not provided. These activities will be performed by FEMP personnel following existing site operation and maintenance procedures.

Asbestos Removal

Individual asbestos work areas will be established within Building 32A. Most of the ACM is in good condition and has not caused any areas to be designated as asbestos areas because of the concern for friable asbestos. Approximately 117 lineal ft. of pipe insulation will be removed as part of the asbestos removal activity. Additional information on asbestos removal can be obtained in Sections 2.5.4 and 3.1.

Above-Grade Dismantlement

Materials from the dismantlement of Building 32A will include piping and conduit; HVAC ductwork and ductwork insulation; equipment; structural and miscellaneous steel; CMU block; roofing material with batting insulation; and, doors and windows.

3.8 Component 32B - Magnesium Storage Covered Loading Dock

Background

The Magnesium Storage Covered Loading Dock (Component 32B) is a single-story shelter measuring approximately 20 ft. x 60 ft. x 15 ft. The rectangular shelter consists of a structural steel frame on a reinforced poured concrete floor with metal roofing. Figures D-13 and D-14 in Appendix D show the floor plan and elevation views of Component 32B. Figures E-21 and E-22 in Appendix E are copies of photographs of the southeast and northwest elevation views of Component 32B.

Component 32B is a covered railroad loading dock with a ramp for vehicle access. The dock was used for loading and unloading materials, primarily drummed or bagged magnesium metal turnings for use in the Metals Production Plant (Building 5A), which were stored in the Magnesium Storage Building (Building 32A).

Above-Grade Dismantlement

Dismantlement of Component 32B will generate materials which will include piping and conduit; structural and miscellaneous steel; and roofing material with batting insulation. The concrete loading dock will be left in place and removed under the SCEP.

3.9 Building 64 - Thorium Warehouse

Background

Building 64 (Thorium Warehouse) is a single-story, pre-engineered building measuring approximately 320 ft. x 50 ft. x 18 ft. It consists of a structural steel frame, metal siding and roofing, with interior block walls and a concrete shield wall, on a reinforced concrete base

floor. Figures D-15 and D-16 in Appendix D show the floor plan and section views of the building. Figures E-26 through E-29 in Appendix E are copies of photographs of the exterior and interior of the building.

Building 64 was originally used to store pallets and drums full of 2.1% enriched uranium in the form of ingots, billets, and top crops. It has since been converted to support thorium overpacking operations. Building 64 contains the two process areas listed below.

Process Area 1 - Thorium Overpacking. The north bay is currently being used for overpacking higher enrichment thorium compounds. Remote equipment and video cameras are being used to perform overpacking operations while utilizing concrete block wall shielding. The south bay is used for repackaging low-level thorium compounds and some RCRA mixed wastes. This area is also used to recondition drums and to overpack drums of trash and uranium materials. The process area currently contains the overpacking control station, inert gas blanketing equipment, and a robot fork truck.

Process Area 2 - Drum Storage. The center and south bays store overpacked thorium wastes and product and temporarily stored uncharacterized mixed wastes. Thorium materials originally came from repackaging operations and/or storage in Building 64, the Plant 1 Thorium Warehouse (Building 67), and the Pilot Plant Warehouse (Building 68).

Preparatory Action: Inventory Removal

Table 3-3 shows the storage quantities of containerized material that will have been removed from Building 64 as part of the inventory removal activity.

TABLE 3-3 Building 64 Inventory Removal

No. of Drums	Description of Material
49	Non-Recoverable Trash - For Storage or Shipment
22	contaminated Soil, Rocks, Sand, Bricks, and Ceramics
1	Contaminated Water or Sump Liquor, Non-Chloride
2	Contaminated Solvent or Organic Chemical
3	Contaminated Graphite - Uncrushed
1	Contaminated Alumina-Soda Lime, High Chloride
4	Contaminated Graphite - Crushed
46	Contaminated Asbestos Materials
54	Scrap Salts, Low Fluoride, Including Floor Sweepings
11	Thorium Residues
2	Sawdust for Oxidation
5	Clean or Decontaminated Equipment
25	Miscellaneous Material

Safe Shutdown
Prior to dismantlement, Building 64 will be placed in a safe and controlled configuration by de-energizing all support services (electricity, water, steam, etc.) to the building. Since this building has not historically been used as a process building, there are no quantities of hold-up materials to be removed. All salvageable equipment from the TOP and any concrete shielding blocks will be removed from the building.

Above-Grade Dismantlement
Materials resulting from the dismantlement of Building 64 will include piping and conduit; equipment (the types of equipment contained in Building 64 are identified in the background discussions at the beginning of this section); structural and miscellaneous steel; CMU block; roofing material; doors and windows; and, interior transite paneling and batting insulation.

3.10 Building 65 - Plant 5 Warehouse

Background
Building 65 (Plant 5 Warehouse) is a single-story, rectangular building measuring approximately 50 ft. x 210 ft. x 22 ft. It consists of a structural steel frame with non-insulated, corrugated metal siding and roofing on a reinforced poured concrete base and floor. The Building is considered to be one process area, which currently stores drummed thorium compounds. Figures D-17 and D-18 in Appendix D show the floor plan and elevation views of the building. Figure E-25 in Appendix E is a copy of a photograph of the exterior of the building and Figure E-30 is a copy of a photograph of the interior of the building.

Preparatory Action: Inventory Removal
Table 3-4 shows the storage quantities of containerized material that will have been removed from Building 65 as a result of the inventory removal (TOP) activity.

Safe Shutdown
Safe shutdown activities for Building 65 will consist of de-energizing all support services to the building. There are no quantities of hold-up materials requiring removal from the building.

Above-Grade Dismantlement
Materials generated during the dismantlement of Building 65 will include piping and conduit; equipment; structural and miscellaneous steel; roofing material; and, doors and windows.

3.11 Building 69 - Decontamination Building

Background
Building 69 (Old Decontamination Building) is a single-story building measuring approximately 43 ft. x 83 ft. x 18 ft. It consists of a structural steel frame, with a metal roof deck and built-up roofing, exterior and interior block walls on a reinforced concrete base floor topped with acid brick.

Building 69 contains one process area, and was used to decontaminate radiologically contaminated scrap metals (ferrous and non-ferrous), miscellaneous equipment, and vehicles. The primary equipment includes five open-top decontamination tanks, a bridge crane, a cleaner/spray washer, fume exhaust ventilation system, air handling units, a vacuum dust collector system, and a scale. Figure D-12 in Appendix D shows Building 69 elevation views.

TABLE 3-4 Building 65 Inventory Removal

No. of Drums	Description of Material
11	Sump Cake - Copper Contaminated, Low Uranium
12	Non-Recoverable Trash - For Storage or Shipment
5	Contaminated Steel After Washing and/or Cleaning
11	Contaminated Soil, Rocks, Sand, Bricks, and Ceramics
21	Contaminated Asbestos Materials
3	Sawdust for Oxidation
1,536	Wet Thorium Oxalate Cake
1	Oxides Clad or Mixed with Zirconium
16	Reject UO_3
18	UO_3 Product
15	UO_3 Reactor Recycle Tails
19	UF_4 or ThF_4
4031	Thorium Hydroxide, Dry
20	Miscellaneous Material (SWIFTS CODE WAS BLANK)

Preparatory Action: Inventory Removal

Table 3-5 lists the storage quantities of containerized material that will have been removed from Building 69 as part of the inventory removal activity.

TABLE 3-5 Building 69 Inventory Removal

No. of Drums	Description of Material
3	Sump Cake - Copper Contaminated, Low Uranium
171	Non-Recoverable Trash - For Storage or Shipment
23	Contaminated Soil, Rocks, Sand, Bricks, and Ceramics
1	Contaminated Water or Sump Liquor, Non-Chloride
88	Miscellaneous Material

Safe Shutdown

Safe shutdown of Building 69 will consist of de-energizing the support services to the building and bringing it to a safe and stable configuration for dismantlement. There are no quantities of hold-up materials to be removed from the building.

Asbestos Removal

Individual asbestos work areas will be established within Building 69. Most of the ACM is in good condition and has not caused any areas to be designated as asbestos areas because of the concern for friable asbestos. Approximately 325 lineal ft. of pipe insulation will be removed as part of the asbestos removal activity. Additional information on asbestos removal can be obtained in Sections 2.5.4 and 3.1.

Above-Grade Dismantlement

Materials generated form the dismantlement of Building 69 will include piping and conduit; equipment; structural and miscellaneous steel; CMU block; above-grade concrete; roofing material with insulation; acid brick; and, doors and windows.

3.12 Building 78 - D & D Building

Background

Building 78 (D & D Building) is a two-story building measuring approximately 100 ft. x 80 ft. x 32 ft. It consists of a structural steel frame, interior and exterior block walls, metal roof deck with built-up roofing, on a reinforced concrete base floor topped with acid brick.

The building was built to decontaminate used furnace pots and other production equipment, but has never been used for that purpose. It has instead been used to decontaminate vehicles, unused furnace pots, scrap metal and other items. Figures D-19 and D-20 in Appendix D show the floor plan and elevation views of the building. Figure E-31 through E-35 in Appendix E are copies of photographs of the exterior and interior of the building.

Preparatory Action: Inventory Removal

Table 3-6 shows the storage quantities of containerized material that will have been removed from Building 78 as part of the inventory removal activity.

Safe Shutdown

Building 78 will be placed in a safe configuration for dismantlement by de-energizing all support services to the building and the removal of all salvageable equipment from the building. No hold-up materials are present in the building.

TABLE 3-6 Building 78 Inventory Removal

No. of Drums	Description of Material
13	Non-Recoverable Trash - For Storage or Shipment
3	Clean or Decontaminated Equipment
15	Miscellaneous Material

Above-Grade Dismantlement

Material generated by the dismantlement of Building 78 will include piping and conduit; equipment; structural and miscellaneous steel; CMU block; roofing material with insulation; and, doors and windows.

3.13 Building 81 - Plant 9 Warehouse

Background

Building 81 (Plant 9 Warehouse) is a single-story, rectangular building measuring approximately 80 ft. x 100 ft. x 15 ft. It consists of a structural steel frame with noninsulated, corrugated metal siding and roofing on a reinforced poured concrete base and floor. It was originally constructed as a storage warehouse for uranium materials (e.g., primary ingots, derbies, cores, and green salt). Modifications were made (e.g., dikes and berms) to meet site standards for RCRA warehouses in 1990 for hazardous waste storage. Figures D-10 and D-11 in Appendix D show the floor plan and elevation views of the building. Figure E-18 and E-19 in Appendix E are copies of photographs of the exterior and interior of the building.

Building 81 is considered one process area and functions as an interim status RCRA storage facility. All dikes, berms, and floors have been coated with an epoxy sealant. Neither of the two collection sumps lead to the wastewater treatment system. The building has a drum capacity of 1,512 (55-gal) drums and currently contains both liquid and solid wastes. Building 81 has undergone or will undergo each of the remedial tasks discussed in Section 2.5 except for safe shutdown preparatory activities since no hold-up or salvageable equipment is present. Activities to be performed under surface decontamination are accounted for under the HWMU decontamination.

Preparatory Action: Inventory Removal

Table 3-7 lists estimated quantities of containerized material that will have been removed from Building 81 as part of the inventory removal activity.

HWMU Decontamination

Purpose. The decontamination requirements needed to accomplish remediation goals for HWMU No. 35 (Plant 9 Warehouse), consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan.

Background/Scope. The entire Plant 9 Warehouse (Building 81) has been designated as an active HWMU since it has been used to store RCRA characteristic and/or listed hazardous wastes after 1989. All drums and containers will be removed from the building prior to turnover to the remediation subcontractor for decontamination and dismantlement. The containerized material that has been designated as RCRA waste have been assigned one or more of the following EPA hazardous waste codes: F001, F002, F005, D002, D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D029, D039, and D040. HWMU No. 35 was declared a HWMU due to storage of RCRA hazardous wastes in excess of the 90-day storage limitation for hazardous waste per OAC3766-51-04(e) and 40 CFR 262.34(b).

Based on an evaluation of HWMU No. 35 during design, it was determined based on process knowledge and facility records, that the HWMU floor surfaces will not require any decontamination rinse. The basis for this determination is facility records which show that seven spills have occurred in the HWMU, the largest of which was estimated to be 16 fluid ounces, and for each spill, the wastes were cleaned up promptly using absorbent pads. No waste residues were left on the floor after the cleanup. Each of the seven spill events involved RCRA characteristic wastes. Prior to any reported spills in the area, all cracks in the floor had been sealed with a rubberized compound and the floor had been coated with a chemically resistant sealant. Based on the spill reports and process knowledge of the area, there is no reason to believe that the concrete debris from the slab will exhibit a RCRA

TABLE 3-7 Building 81 Inventory Removal

No. of Drums	Description of Material
1	Discard Process Residues
35	Non-Recoverable Trash - For Storage or Shipment
1	Trailer Cakes, Waste Slurries, Raffinates
37	Contaminated Soil, Rocks, Sand, Bricks, and Ceramics
2	Contaminated Water or Sump Liquor, Non-Chloride
1	Contaminated Solvent or Organic Chemical
1	Contaminated Asbestos Materials
1	Dust Collector Bags
14	Sludges, Cleanout, Non-Oily, For Roasting
3	Samples, Non-Metallic, Miscellaneous
3	Lead and Lead-Contaminated Materials
34	Wet Sump or Filter Cake, Halide Contaminated
5	U or Th Nitrate Solutions, High Impurity
2	U or Th Chloride or Fluoride Solutions, High Impurity
1	Unfired Reduction Charges Plus MgF_2
285	Thorium Residues
7	Scrap U_3O_8 or ThO_2, High Fluoride
5	Sawdust for Oxidation
2	Non-Briquettable Chips and Turnings For Oxidation
2	Miscellaneous Material - Recovery TBD
2	Uranyl or Thorium Nitrate Solution
1	UO_2 or ThO_2 Powder - Refinery Feed
2	Solid Metal to be Pickled
16	Miscellaneous Material (SWIFTS CODE WAS BLANK)

characteristic. The concrete debris that will be generated whenever the floor (pad) of this HWMU is dismantled will be eligible for disposal in the OSDF. The dismantling of the pad will be addressed in the SEP to be developed under the OU5 RD/RA process.

Above-Grade Dismantlement

Dismantlement of Building 81 will generate materials that will include piping and conduit; equipment; structural and miscellaneous steel; roofing material; and, doors and windows.

3.14 Component G-001 - Railroad Tracks

Background
Within the boundaries of the Thorium/Plant 9 Complex is approximately one half mile of railroad tracks. Historically, rail service was provided to Building 32A and the Plant 9 area. The boundaries of the railroad track removal includes the southern terminus of the tracks on the pad east of Plant 9 and the intersection of the tracks with the northern edge of the Decontamination Pad which surrounds Building 69.

Above-Grade Dismantlement
Dismantlement of this component will generate steel rails which will be managed under the Thorium/Plant 9 Complex Waste Management Plan. The wooden railroad ties will be left in place to be removed with other at- and below-grade materials by the Soil Characterization and Excavation Project.

3.15 Component G-008 - Pipe Bridges

Background
The pipe bridges are steel structures which support the steam lines and other lines required for processing activities which took place in the Thorium/Plant 9 Complex buildings. One bridge crosses 2nd Street and enters Plant 9 on the South side. A second bridge follows an irregular course and enters Building 78 on the West side.

Safe Shutdown
Safe shutdown activities will consist of de-energizing all electrical services, disconnection and isolation of steam lines, and disconnecting water lines. No hold-up materials are present.

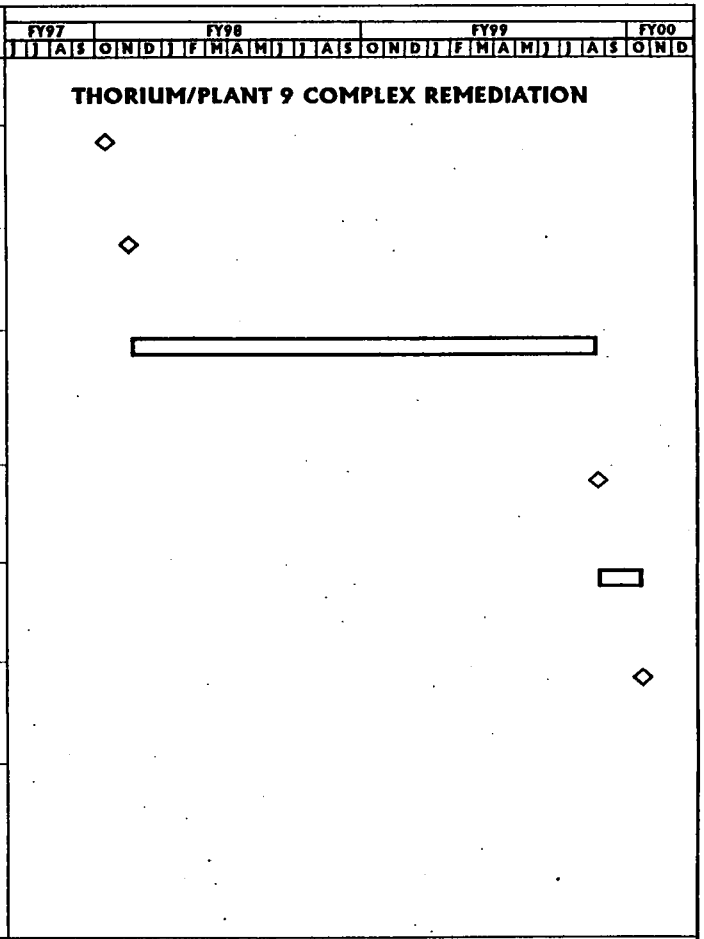
Asbestos Removal
Asbestos removal will consist of removing insulation from pipes and steam lines.

Above-Grade Dismantlement
Dismantlement of this component will generate structural steel, pipe and conduit. Concrete support footings will be left in place and removed with other at- and below-grade materials by the Soil Characterization and Excavation Project.

4.0 SCHEDULE

This section presents the planning and implementation schedules for the Thorium/Plant 9 Complex remedial action project. Figure 4-1 presents the schedule for implementation of field activities beginning with the remediation subcontractor's Notice To Proceed and ending with the submittal of the Project Completion Report. Since inventory removal and safe shutdown activities are preparatory actions and were already completed, they are not specifically represented in the schedule. Within Figure 4-1, the primary milestones of the project include initiation and duration of remediation field activities, project completion ("Completion of Field Activities"), and the preparation and submittal of the Project Completion Report to U.S. EPA and Ohio EPA.

ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	ORIG DUR
AWARD THORIUM/PLANT 9 SUBCONTRACT	15OCT97		0
NOTICE TO PROCEED	15NOV97		0
FIELD REMEDIATION OF THORIUM/PLANT 9 COM (INCLUDES SUBCONTRACTOR WP's, MOBILIZATION AND DEMOBILIZATION)	18NOV97	17AUG99	638
COMPLETION OF FIELD ACTIVITIES		17AUG99	0
PREPARE PROJECT COMPLETION REPORT	18AUG99	16OCT99	60
SUBMIT PROJECT COMPL REPORT TO US/OEPA		16OCT99	0



DURATIONS BASED ON CALENDAR DAYS

Plot Date 22JUL97
Data Date 22NOV96
Project Start 1JUN96
Project Finish 16OCT99

(c) Primavera Systems, Inc.

Activity Bar/Early Date
Critical Activity
Progress Bar
Milestone/Flag Activity

Sheet 1 of 1

CERCLA/RCRA UNIT 3
OU3 D&D SCHEDULE
THORIUM/PLANT 9 REMEDIATION

FLUOR DANIEL FERNALD

Date	Revision	Checked	Approved

FIGURE 4-1 Thorium/Plant 9 Complex Remediation Schedule

5.0 MANAGEMENT

The implementation of the Thorium/Plant 9 Complex decontamination and dismantlement project will be performed through a coordinated effort by the remediation subcontractors, FEMP organizations, remedial design subcontractor, and DOE project management. Section 7 of the OU3 Integrated RD/RA Work Plan provides the overall management structure applied to this remediation project. A description of project-specific management responsibilities have been highlighted for Thorium/Plant 9 Complex in this section.

DOE will provide direct project oversight in two ways, both of which become a concerted effort that ensures performance of remedial activities in adherence to project specifications and requirements. The DOE Office of Safety Assessment will assign a Facility Representative to the Fernald Area Office whose responsibilities will be to perform independent field oversight of all remedial activities performed under this project. This individual will be experienced/knowledgeable in the areas of engineering, construction, quality assurance/quality control, and health and safety; and will be responsible for daily inspections of all field activities and necessary reporting to the DOE Program Manager at the Fernald Area Office. The Facilities Representative will have the authority to stop work if conditions warrant such action. DOE Fernald Area Office will also conduct field oversight through technical leads responsible for construction, engineering, quality assurance and quality control, and health and safety. The DOE Facilities Representative and technical leads will immediately notify the DOE Program Manager of any issues or problems that arise in an effort to seek prompt resolution.

The DOE Program Manager and the environmental management contractor will oversee the remedial action through its Design-Engineering-Construction (DEC) team review and approval process and by performing the following functions:

- ensuring that the selection of qualified subcontractor(s) is based on meeting prequalification criteria, demonstrate a good safety record, possess similar work experience, and rank high on a detailed technical proposal assessment;
- assuring that the apparent low bidder is responsive and responsible;
- reviewing, commenting, and approving of remediation subcontractor work plans;
- prior to commencing some of the activities (e.g., decontamination), ensuring that the performance specifications going to be met by requiring the remediation subcontractor to demonstrate to the FEMP the ability of its proposed methods to meet the performance specifications;
- conducting an alignment meeting, pre-construction meetings, and weekly coordination meetings with the remediation subcontractor to address all concerns, schedule status, planning, progress, deviations;
- performing quality assurance and quality audits of all remediation tasks to determine adherence to performance specifications by conducting inspections of the remedial activities performed by the remediation subcontractor and those performed by FEMP work forces/labor support contractors in support of the remedial action;

- verifying work is performed in compliance with approved health and safety plans; and

- performing pre-final and final inspections.

The subcontracting strategy allows the prime remediation subcontractor to utilize several lower tier subcontractors, each with specific remediation tasks. One remediation subcontract will include decontamination and dismantlement of the components included within the Thorium/Plant 9 Complex project, which includes the responsibility for material segregation and loading, container weighing, tagging and movement of containers to and from queuing area.

REFERENCES

U.S. Department of Energy, 1993, *Operable Unit 3 Remedial Investigation and Feasibility Study Work Plan Addendum*, Final, prepared by Fernald Environmental Restoration Management Corporation, Cincinnati, Ohio.

U.S. Department of Energy, 1994, *Operable Unit 3 Record of Decision for Interim Remedial Action,* Final, prepared by Fernald Environmental Restoration Management Corporation, Cincinnati, Ohio.

U.S. Department of Energy, 1995, *Operable Unit 3 Remedial Design/Remedial Action Work Plan for Interim Remedial Action*, Final, prepared by Fernald Environmental Restoration Management Corporation, Cincinnati, Ohio.

U.S. Department of Energy, 1996a, *Operable Unit 3 Remedial Investigation and Feasibility Study Report*, Final, prepared by Fernald Environmental Restoration Management Corporation, Cincinnati, Ohio.

U.S. Department of Energy, 1996b, *Operable Unit 3 Record of Decision of Final Remedial Action*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1996c, *FEMP Stormwater Pollution Prevention Plan*, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997a, *Operable Unit 3 Integrated Remedial Design/Remedial Action Work Plan*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997, *Integrated Environmental Monitoring Plan*, Draft Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

APPENDIX A

PROPOSED SAMPLING

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APPENDIX A

PROPOSED SAMPLING

The following methodologies were developed based on data needs identified in the Sampling and Analysis Plan, included as Appendix D to the OU3 Integrated RD/RA Work Plan. A project specific summary of the sample types are included in this implementation plan and are based on assumptions outlined below.

Characterization Screening
Screening has been conducted using X-Ray Fluorescence (XRF) screening of media for lead based paint. Screening has been conducted for fixed and removable radioactive contamination using Geiger-Mueller radiological contamination meters.

Asbestos
This category represents samples needed to verify whether a certain material is considered ACM and whether the ACM is regulated or non-regulated.

Secondary Waste (Decontamination Water)
General decontamination water will be sampled to determine potential treatment prior to discharge into the WWTS. It is estimated that 8 samples will be required to characterize wash water for isotopic radionuclides, heavy metals, volatile organic compounds, PCBs, oils and grease. Approximately 88 samples may be required to evaluate enrichment (i.e., levels of U-235 to total Uranium) of batched waste water from equipment decontamination prior to discharge.

Nevada Test Site (NTS) Confirmatory
One per cent of each material/waste stream going to NTS is required to be sampled, and then three samples per container (for that one per cent sampled) in accordance with the NTS Waste Acceptance Criteria (WAC). Based on the materials projected for NTS disposal, it is estimated that 6 samples will be required. Sampling and analysis will have to meet the NVO-325 requirements discussed in the SAP contained in Appendix D of the draft OU3 Integrated RD/RA Work Plan.

Permitted Off-site Commercial Disposal Facility
Mixed waste, such as radiologically contaminated lead flashing and acid brick may be disposed of at an off-site mixed waste disposal facility. If this is necessary, confirmatory sampling will be required to verify whether or not the waste meets the WAC for the disposal facility. Sampling and analysis required for shipment certification will be as specified by the permitted facility's WAC.

Asbestos Air Monitoring
Asbestos air sampling will occur over the duration of the asbestos removal activity. Interior and exterior containment perimeter monitoring will be conducted during asbestos removal activities to detect any releases of friable asbestos to protect workers. Occupational breathing zone air monitor samples will also be utilized during asbestos removal within closed areas.

Radiological Air Monitoring
Supplemental and existing fence line environmental air monitoring stations established for project specific monitoring will be analyzed weekly by site personnel during decontamination and dismantlement activities.

Occupational air samplers will be worn by at least twenty-five per cent (25%) of the workers in each work group/crew (minimum of 1 worker) when entering a radiological area controlled for contamination or airborne radioactivity. More specific information on radiological worker protection can be found in the Radiation Requirements Plan of the subcontract.

APPENDIX B

DECISION METHODOLOGY
FOR
FERNALD SCRAP METAL DISPOSITION ALTERNATIVES

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APPENDIX B

DECISION METHODOLOGY FOR FERNALD SCRAP METAL DISPOSITION ALTERNATIVES

In accordance with the commitment to perform a disposition methodology evaluation on potentially recyclable/reusable materials from each project, pursuant to Section 3.3.6.1 of the OU3 Integrated RD/RA Work Plan under the subheading of Unrestricted Release Recycling/Reuse, an initial version of the Decision Methodology For Fernald Scrap Metal Disposition Alternatives (the "Methodology") was applied in December 1996 to Accessible Metals (OU3 Debris Category A) from Building 9A. A summary of some preliminary results were provided in the draft version of this implementation plan in January 1997. However, since the Methodology is currently being revised, the previous results are no longer valid.

Upon finalization of the revised Methodology, including resolution of stakeholder comments, the Methodology will be applied to Plant 9 Accessible Metals. A summary of the results of the evaluation will be prepared as an amendment to this appendix and submitted to the regulatory agencies for review.

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APPENDIX C

PERFORMANCE SPECIFICATIONS

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APPENDIX C

PERFORMANCE SPECIFICATIONS

The performance specifications listed on Page C-3 are project-specific versions of the standard set of performance specifications attached as Appendix B to the OU3 Integrated RD/RA Work Plan. The standard specifications were revised in concert with Thorium/Plant 9 Complex project planning and a duplicate set was prepared for the Thorium/Plant 9 Complex project. The performance specifications for the Thorium/Plant 9 Complex are current through the finalization of this implementation plan and are listed with a project-specific title (i.e., Thorium/Plant 9 Complex Decontamination and Dismantlement Engineering Performance Specifications), reference number, and reflect the appropriate revision number.

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THORIUM/PLANT 9 COMPLEX DECONTAMINATION AND DISMANTLEMENT ENGINEERING PERFORMANCE SPECIFICATIONS

(Reference: EE-Specifications 1742-TS-0001)

TABLE OF CONTENTS

DIVISION 15 - MECHANICAL

15065	EQUIPMENT DISMANTLEMENT	1	03/06/97
15066	INTERIOR DISMANTLEMENT	1	03/06/97
15067	VENTILATION AND CONTAINMENT	0	02/14/97

DIVISION 16 (NOT USED)

APPENDIX D

DESIGN DRAWINGS

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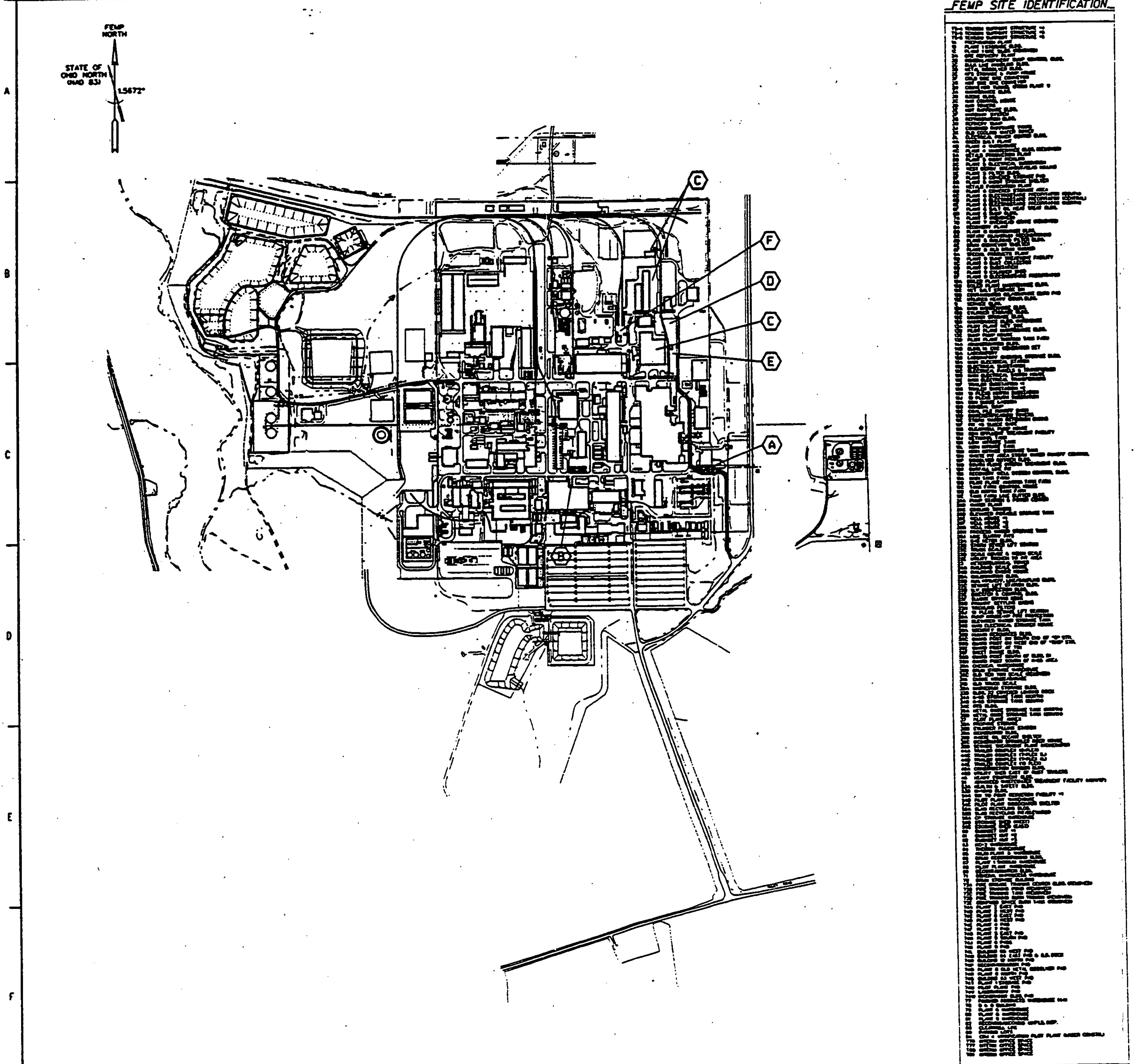
APPENDIX D

DESIGN DRAWINGS

The following drawings are copies of the blueprint drawings that were prepared during the remedial design for the Thorium/Plant 9 Complex - Phase I project. Figures D-1, D-2 and D-12 show plan views of the site, project area and Thorium/Plant 9 Complex area, respectively. Figures D-3, D-7, D-8, D-10, D-14, D-16, D-18 and D-20 floor plans of components in the complex. The balance of the drawings show elevation or isometric views of the components. The key features shown in these drawings (Process Areas and related equipment) are discussed in Section 3 of this implementation plan.

FIGURES



NOTES

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING WERE PREPARED FROM FEMP SITE PROVIDED DATA FROM THE DOCUMENTS LISTED BELOW.

EXISTING SITE DATA SOURCE (IN PLANT FILES)
PARSONS TOPOGRAPHY, 1992
FEMP CADD GRID/UTILITY DRAWINGS
FEMP CONTRACTOR PROJECT DESIGN DOCUMENTS

2. PERSONNEL ENTRY INTO THE ADMINISTRATIVE AREA IS THROUGH BUILDING 20A.

LEGEND

- (A) GATE FOR EQUIPMENT ENTRY
- (B) GATE FOR PERSONNEL ENTRY INTO THE CONTROLLED AREA
- (C) CONSTRUCTION SITE
- (D) SUBCONTRACTOR OFFICE TRAILER AND STORAGE AREA.
- (E) CONTAINER QUEUING AREA
- (F) PROPOSED RADIOLOGICAL CONTROL UNIT FACILITY AREA
- SUBCONTRACTOR CONSTRUCTION ZONE BOUNDARY
- EQUIPMENT ACCESS ROUTE TO WORKSITE

FOR INFORMATION ONLY

0	CERTIFIED FOR CONSTRUCTION	MLB 2-21-95		

UNITED STATES
DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

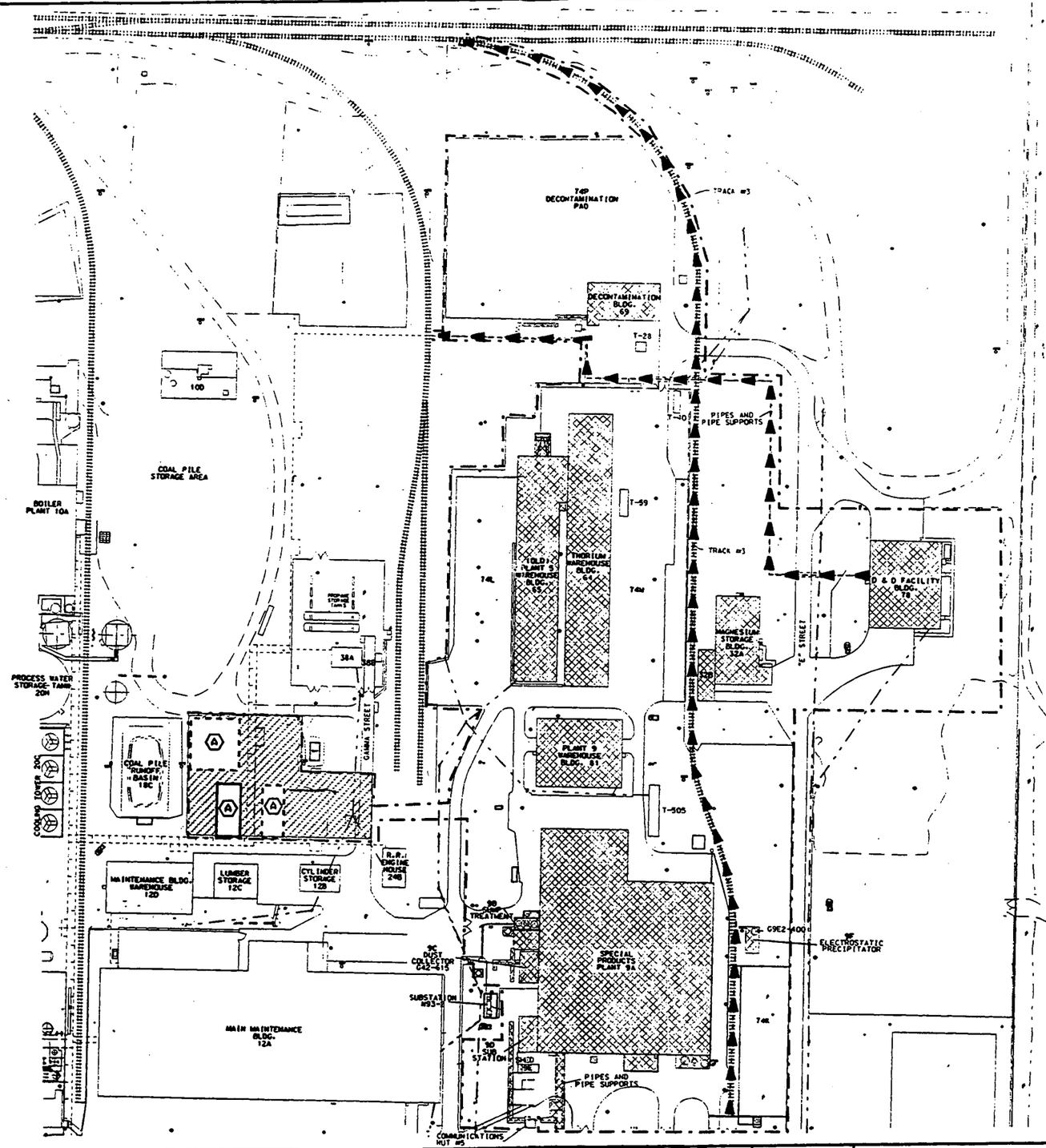
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

D&D DESIGN FOR THE
THORIUM PLANT 9 COMPLEX

CIVIL
PRODUCTION AREA SITE MAP
THORIUM PLANT 9 COMPLEX

L.I. GEORGE 12/15/94 | EDWARD J. ... 2/20/95 | ... 02/08/95
PLANT 9 COMPLEX | SCALE 1"=300'
MICHAEL P. BOLAND 2-21-95 | C.L. GRIFFIN 2/21/95
CRU3/P0136 | WBS 1.1.1.1.3.3.7 00-90701 | 93X-5900-G-00662 | G0001 | 0

FIGURE D-1 Production Area Site Map
Thorium/Plant 9 Complex



LEGEND

- FACILITIES TO BE DEMOLISHED
- CHANGE OUT/CAFETERIA AREA
- MISC TO BE REMOVED
- (A) PROPOSED SUPPORT FACILITY
- SUBCONTRACTOR CONSTRUCTION ZONE BOUNDARY

LIST OF BUILDINGS/COMPONENTS TO BE REMOVED

9A	SPECIAL PRODUCTS PLANT
9B	SUMP TREATMENT
9C	DUST COLLECTOR
9D	SUB STATION
9E	SHED
9F	ELECTROSTATIC PRECIPITATOR
32A	MAGNESUIM STORAGE
32B	COVERED LOADING DOCK
65	PLANT 5 WAREHOUSE
64	THORIUM WAREHOUSE
69	DECOTAMINATION BLDG.
78	D & D FACILITY
81	PLANT 9 WAREHOUSE

TANKS F1-1, F1-2, F1-3, T-2429, PPT, WATER ACID, ACID, F-9N1-700, G9E2-400,
MISCELLANOUS: PIPES, PIPE SUPPORTS AND RAILROAD TRACKS

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING WERE PREPARED FROM FEMP SITE PROVIDED DATA FROM THE DOCUMENTS LISTED BELOW.

   EXISTING SITE DATA SOURCE (IN PLANT FILES)
   FEMP CADD GRID/UTILITY DRAWINGS
   FEMP CONTRACTOR PROJECT DESIGN DOCUMENTS

2. INFORMATION ON THE LOCATIONS OF EXISTING FEATURES SHOWN ON THIS PLAN WERE TAKEN FROM FERNALD SITE DRAWINGS. NO FIELD VERIFICATION BY SURVEY HAS BEEN PERFORMED.

3. SUBCONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS INCLUDING ELEVATIONS BEFORE STARTING CONSTRUCTION AND/OR FABRICATION. ANY DEVIATIONS NOTED SHALL BE BROUGHT TO FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER'S ATTENTION IN WRITING IMMEDIATELY AND RESOLVED BEFORE CONTINUING WITH CONSTRUCTION.

4. EXISTING HARD SURFACE PAVEMENTS (ASPHALT, CONCRETE, ETC.) TO REMAIN UNDISTURBED UNLESS APPROVED BY FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER.

5. SUBCONTRACTOR SHALL PROTECT ALL UNDERGROUND UTILITIES AND MONITORING WELLS. SEE DRAWING 22C-5500-P-00668, 22C-5500-P-00669, 22C-5500-P-00670, 22C-5500-P-00660, 22C-5500-P-00661, 22C-5500-P-00662 FOR UTILITIES.

6. LAYDOWN AREAS SHALL BE DETERMINED BY SUBCONTRACTOR WITH APPROVAL BY FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER.

7. AT THE COMPLETION OF THE PROJECT, SUBCONTRACTOR SHALL REMOVE AND STORE THE TEMPORARY CONSTRUCTION FENCE AND GATES IN THE LOCATION DESIGNATED BY FLOUR DANIEL, FERNALD CONSTRUCTION MANAGER.

8. FOR DIMENSIONS AND DETAILS OF BUILDING FACILITIES REFERENCE THE EXISTING FILE DRAWINGS.

9. CONTRACTOR SHALL VERIFY THAT THE UTILITIES TO PIPE RACK HAVE BEEN PROPERLY DISCONNECTED AND END CAPPED. UTILITY DISCONNECT AND CAPPING WORK BY FLOUR DANIEL, FERNALD.

10. RADIOLOGICAL CONTROL FENCES WILL BE INSTALLED BY FLOUR DANIEL, FERNALD.

11. TRAILERS T-49,59, AND 28 TO BE REMOVED PRIOR TO THE START OF THE PROJECT

PRELIMINARY INFORMATION ONLY CADD SERVICES

000064

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	UPDATED CHANGE OUT AREA, NOTES, TRAILERS	4-99	JSW	GEP
0	CFC	3-99	JSW	GEP

NOTE: FLUOR DANIEL FERNALD CADD DRAWING, DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

APPROVALS			
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER	F. CONTRACT	FIRE PROTECT	
INSTRUMENT		WASTE MANAGE	
MECHANICAL		SECURITY	
		CRU	
CHECKED	GP	DISPOSITION	
APPROVED	S. ENG.		

Fernald Environmental Management Project

FLUOR DANIEL FERNALD

U.S. DEPARTMENT OF ENERGY

PLANT 9 AREA

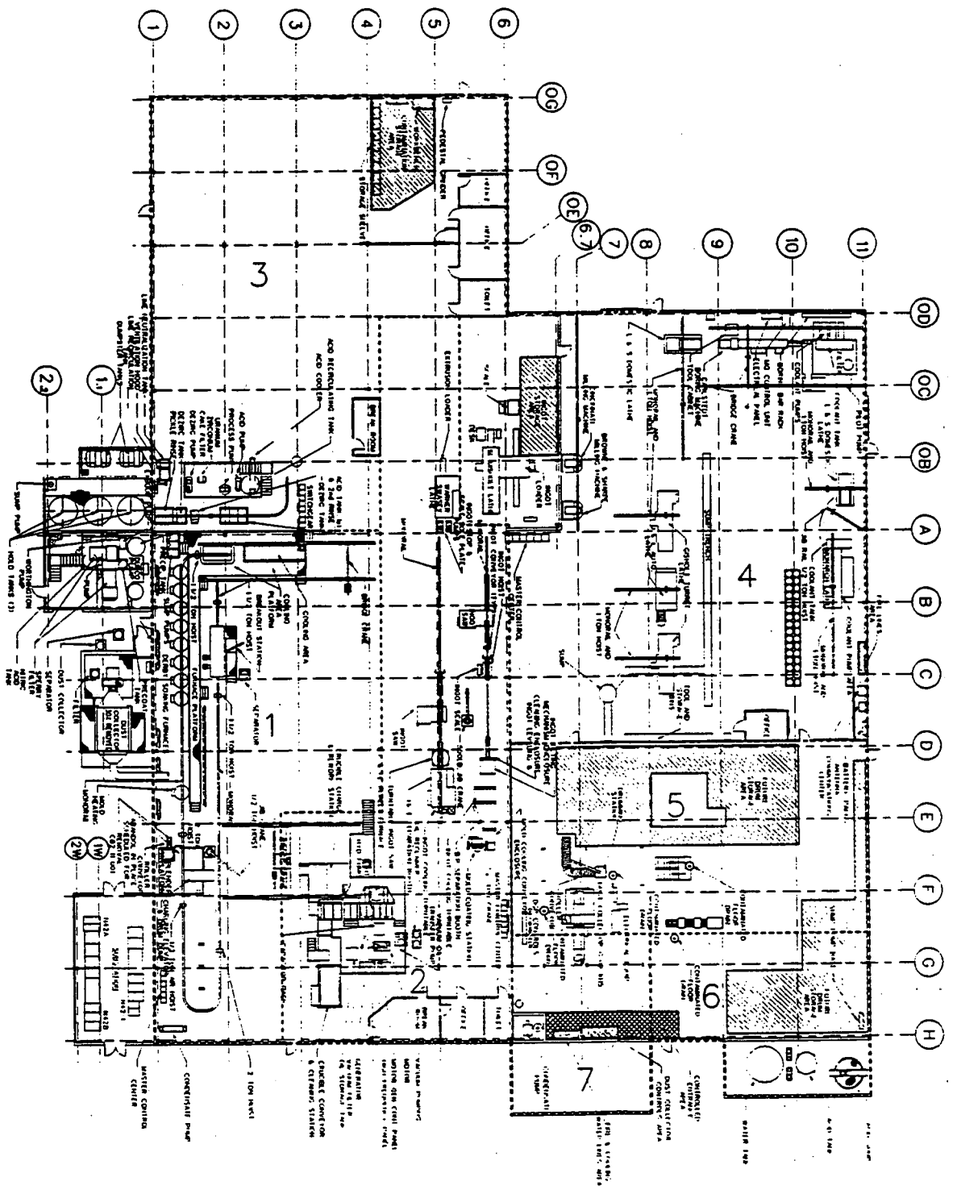
THORIUM PLANT 9 AREA COMPLEX

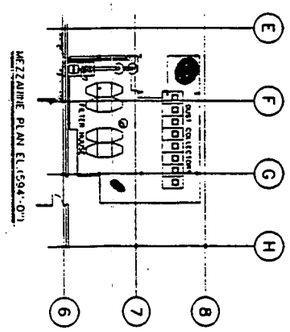
CIVIL DEMOLITION PLAN

NO SCALE

09X-5500-X-03973 1

FIGURE D-2 Thorium/Plant 9 Complex - Civil Demolition Plan





LEGEND

PROCESS 1 - URANIUM PRODUCTION AND DERBY CLEANING
PROCESS 2 - ENRICHED URANIUM CASTING
PROCESS 3 - ZIRNLO DECLADDING
PROCESS 4 - URANIUM MACHINING
PROCESS 5 - HEAT TREATING (HISTORICAL PROCESS-
CURRENTLY DUST COLLECTOR)
PROCESS 6 - SCRAP METAL PICKLING (HISTORICAL PROCESS-
CURRENTLY DUST COLLECTOR)
PROCESS 7 - BRIQUETTING (HISTORICAL PROCESS-
CURRENTLY DUST COLLECTOR)

FERNALD ENVIRONMENTAL
RESTORATION MANAGEMENT
CORPORATION
FEMP
Fernald
Environmental Management Project
U.S. DEPARTMENT OF ENERGY

9A FIRST FLOOR
SPECIAL PRODUCTS PLANT
FLOOR PLAN
1" = 40'

DATE 05-15-95
DRAWN R. Williams

000065

FIGURE D-3 Floor Plan of Building 9A

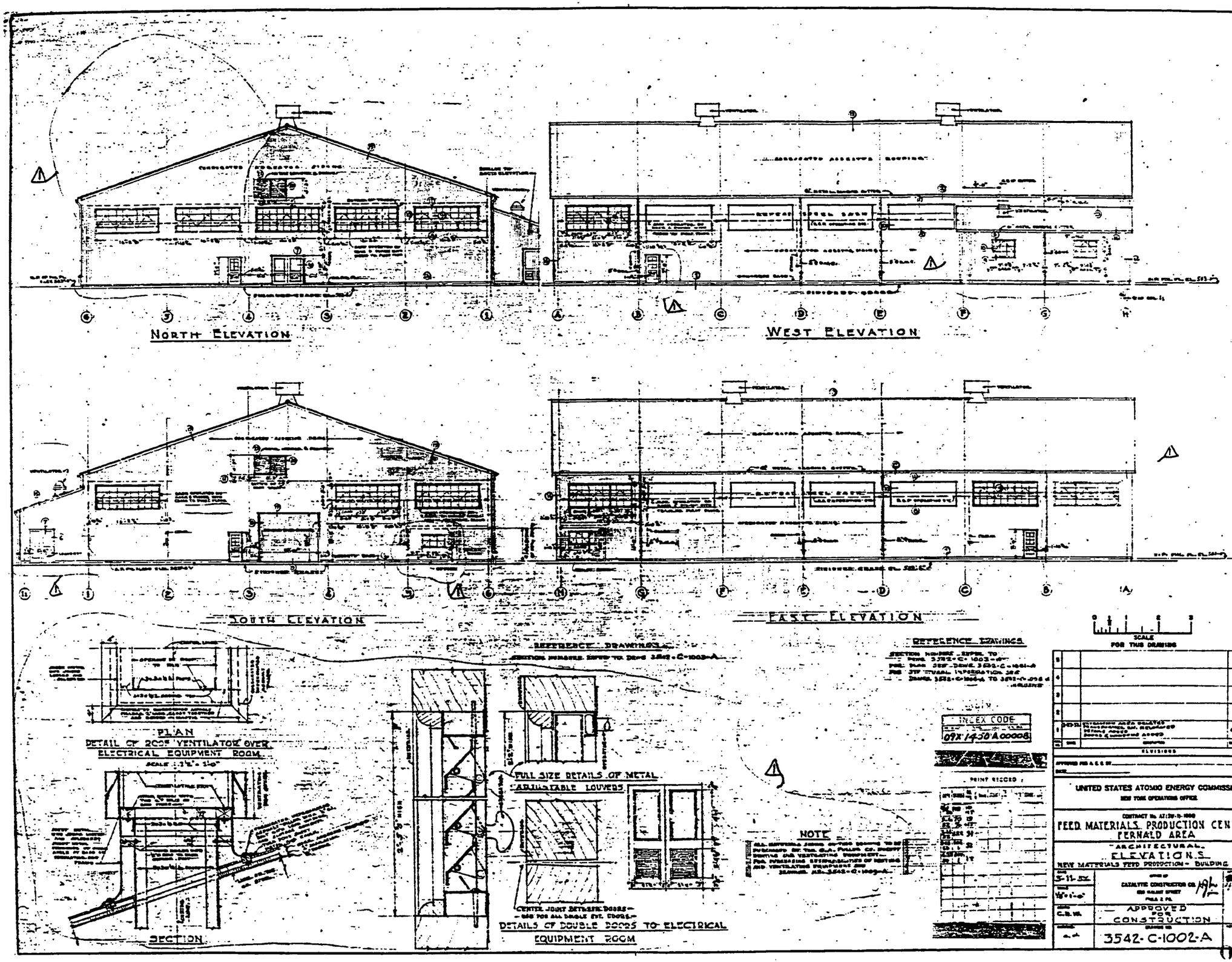


FIGURE D-4 Original Elevations of Building 9A

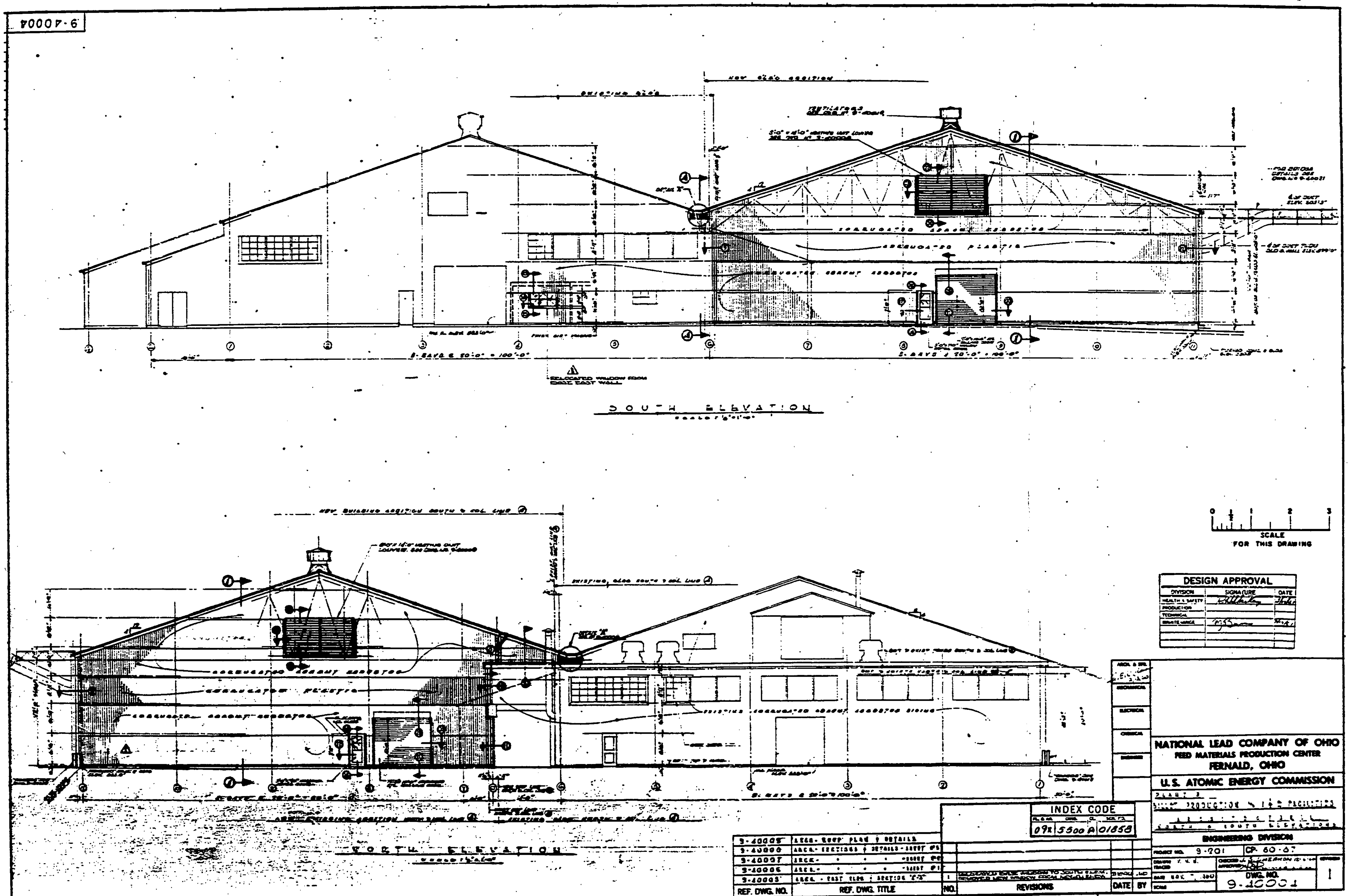
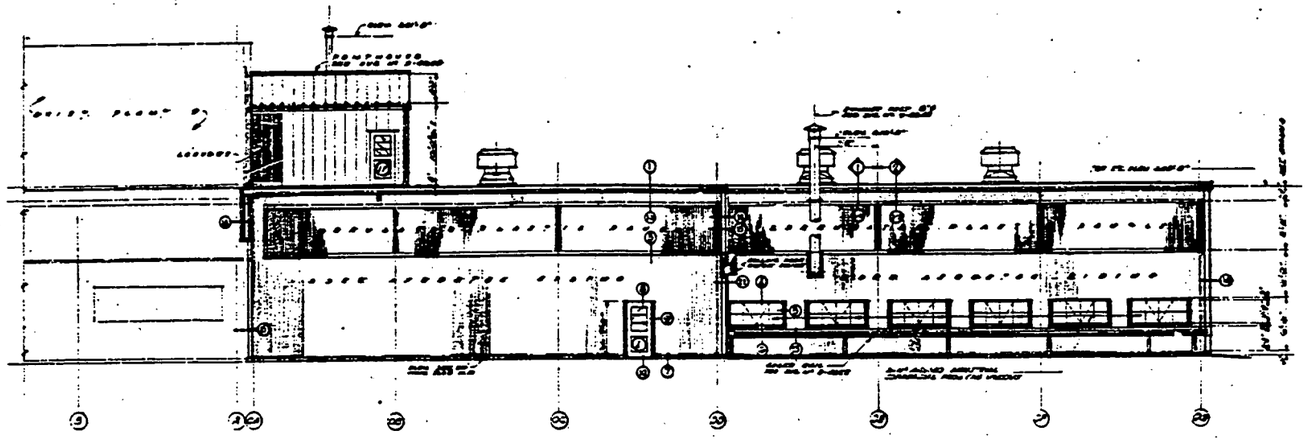
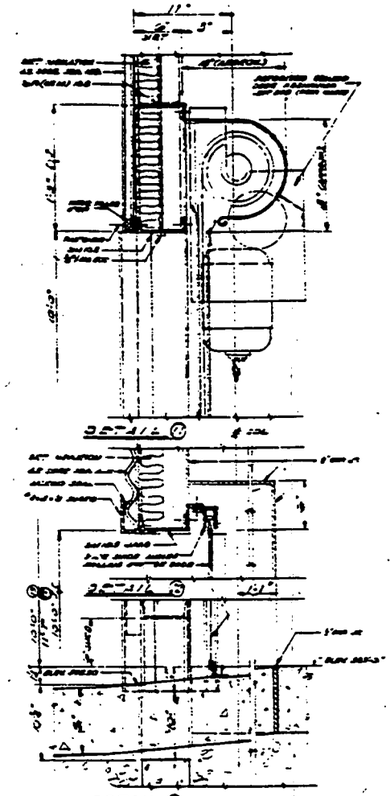
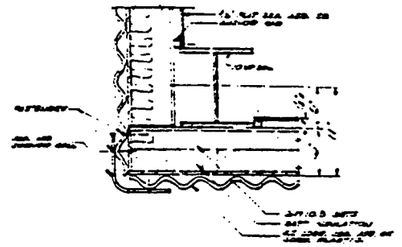


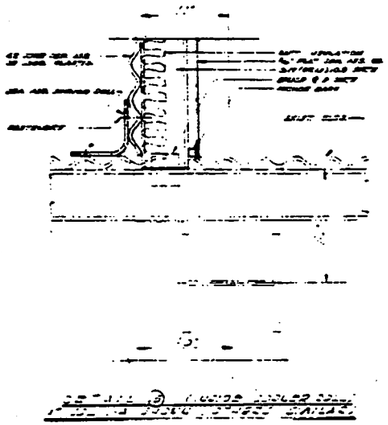
FIGURE D-5 North and South Elevations of Building 9A (After Expansion)

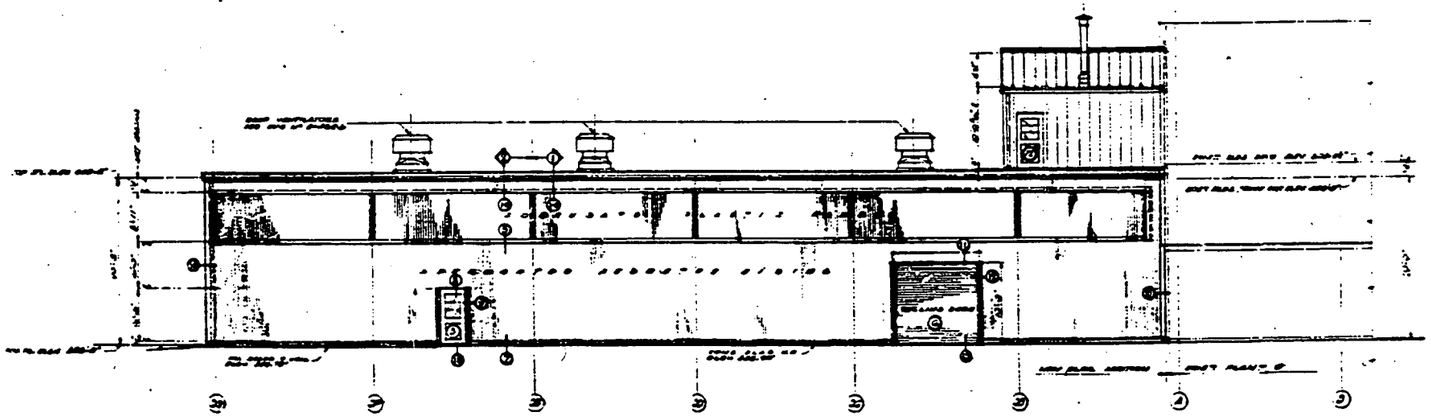
1237-6











DESIGN APPROVAL		
DIVISION	SIGNATURE	DATE
MECHANICAL & SAFETY		
PROCESSING		
TECHNICAL		
SERVICE WORKS		
ENGINEERING		

REF. DWG. NO.	REF. DWG. TITLE
9-4217	FLOOR PLAN - DOOR SCHEDULE
9-4246	LAYOUT OF DUCT (CHANGE FROM DUCT WALL)
9-4225	FOUNDATION DETAILS
9-4222	DETAILS NO. THRU 30
9-4220	NORTH & SOUTH ELEV. - DETAILS 1 THRU 10

NO.	REVISIONS	DATE	BY

SCALE FOR THIS DRAWING: 0 1/2 1 2 3

INDEX CODE: 09x | 5500 | A101523

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

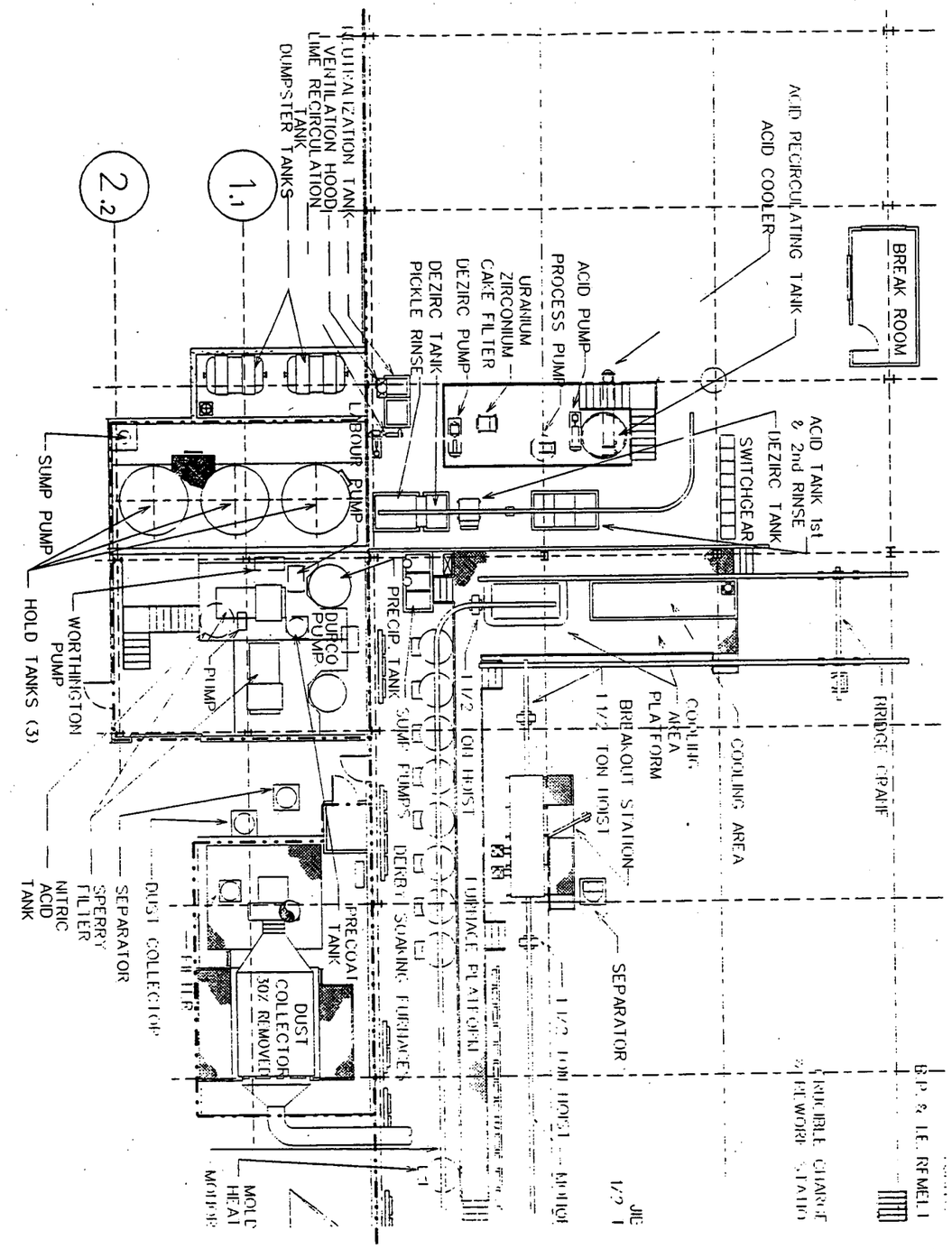
U.S. ATOMIC ENERGY COMMISSION

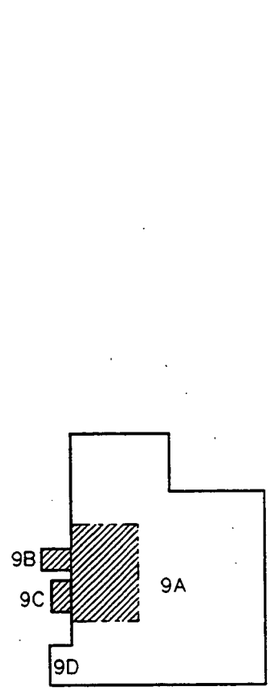
ENGINEERING DIVISION

DWG. NO. 9-4221

0000068

FIGURE D-6 East and West Elevations of Building 9A (After Expansion)





KEY MAP

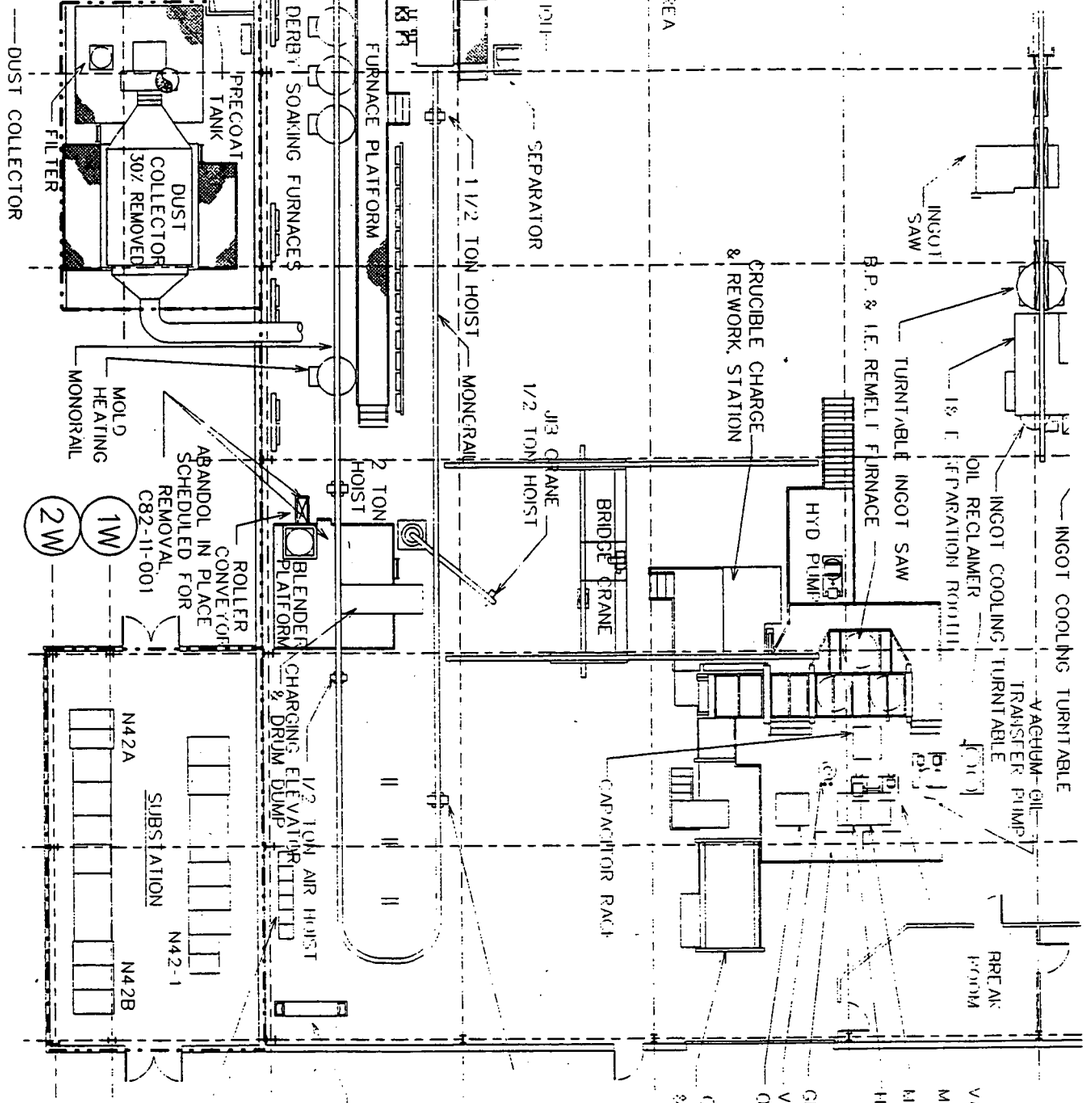
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
FERMCO
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

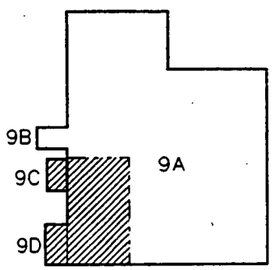
9B & 9C FIRST FLOOR
PLANT 9 SUMP TREATMENT FACILITY AND DUST COLLECTOR
FLOOR PLAN
1" = 15'

DATE 05-15-95
DRAWN R. Williams

000069

FIGURE D-7 Floor Plan of Building 9B and Component 9C





FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
Fernald
Environmental Management Project
U.S. DEPARTMENT OF ENERGY

9D FIRST FLOOR
PLANT 9 SUBSTATION
FLOOR PLAN
1" = 15'

DATE 05-15-95
DRAWN R. Williams

000070

FIGURE D-8 Floor Plan of Building 9D

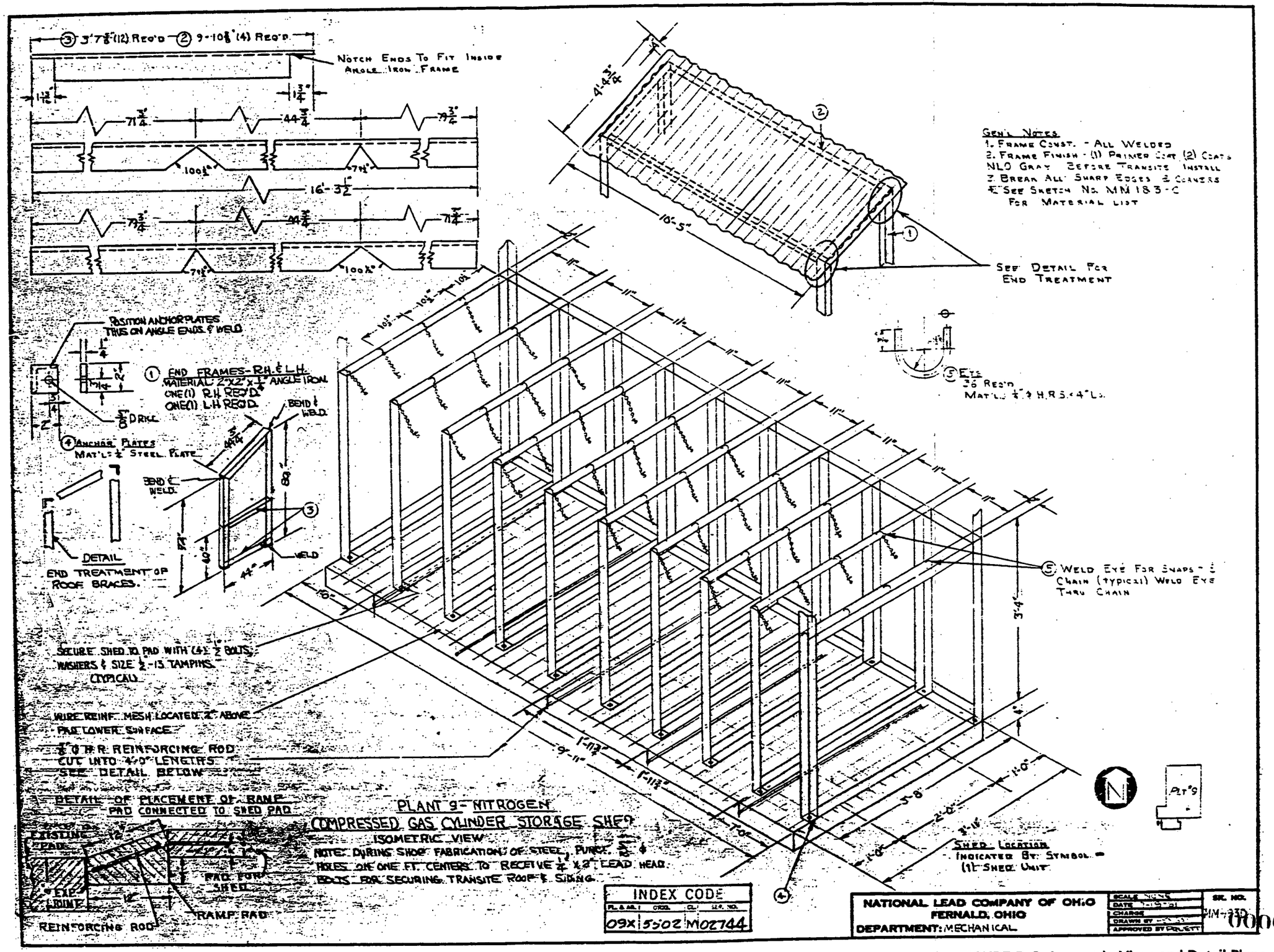
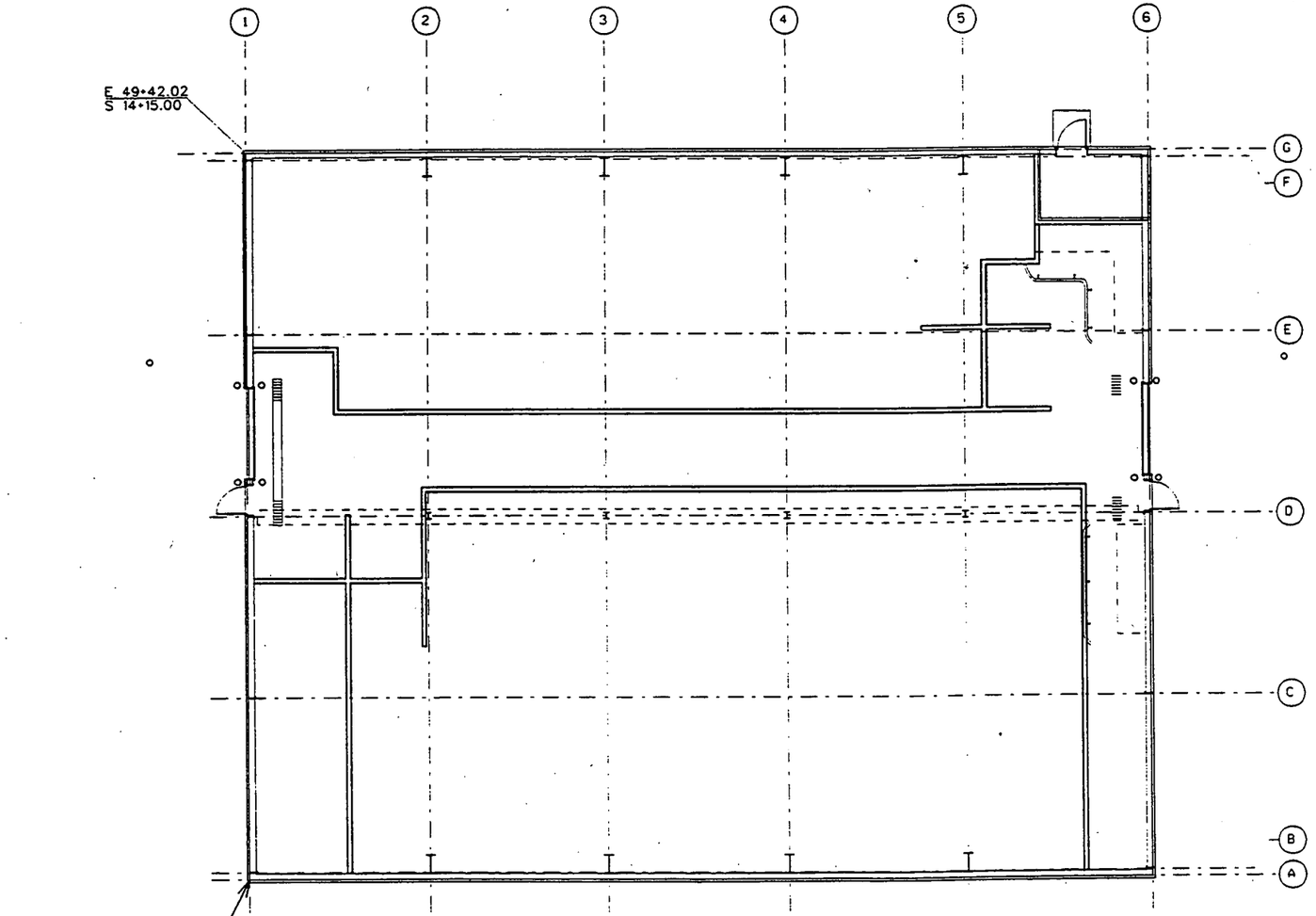
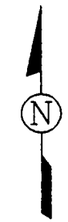


FIGURE D-9 Isometric View and Detail Plans of Building 9E





FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
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U.S. DEPARTMENT OF ENERGY

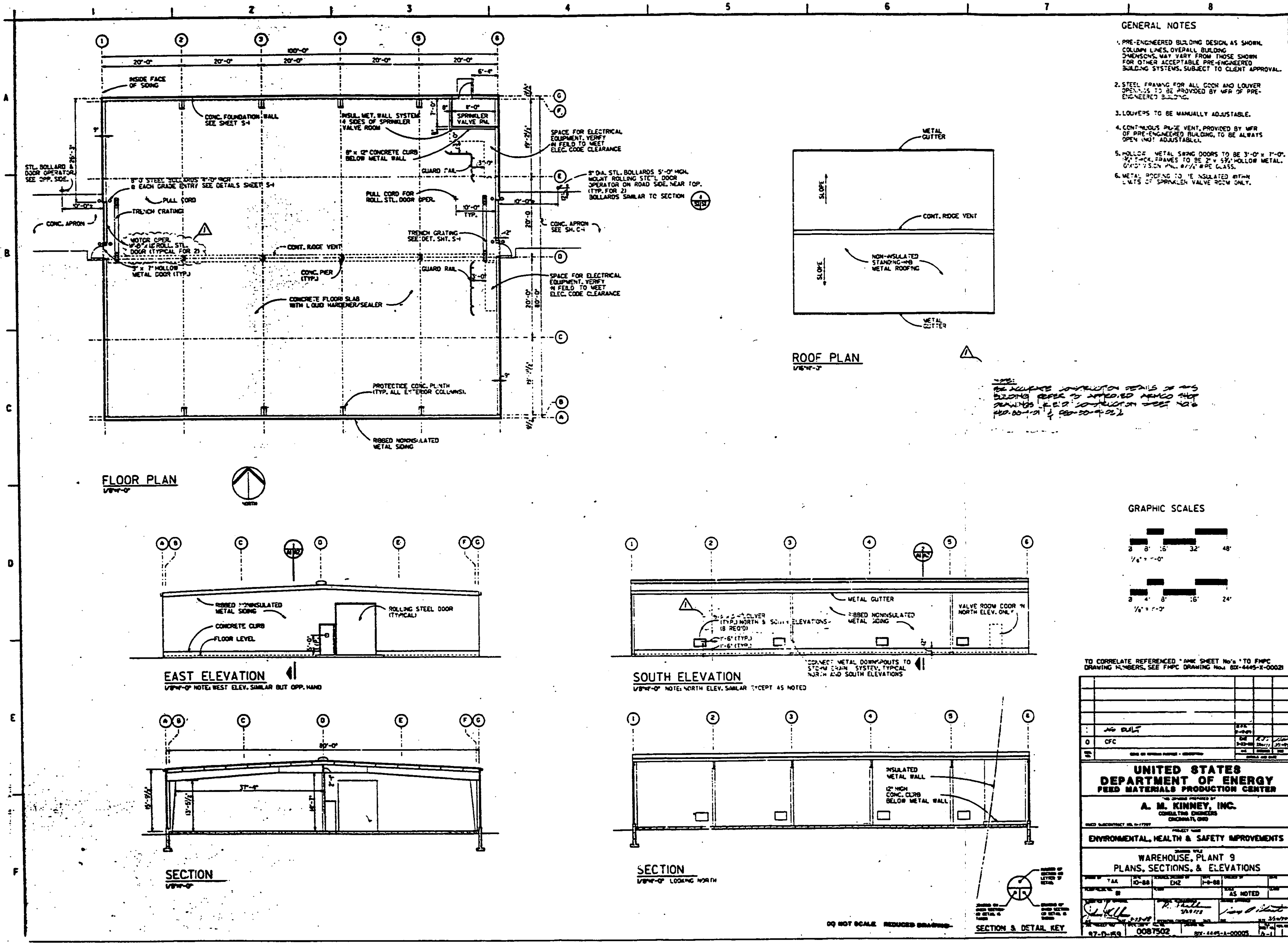
81 FIRST FLOOR

PLANT 9 WAREHOUSE
FLOOR PLAN
1" = 15'

DATE 04-10-95
DRAWN R. Williams

000072

FIGURE D-10 Floor Plan of Building 81



000073

FIGURE D-11 Elevations of Building 81

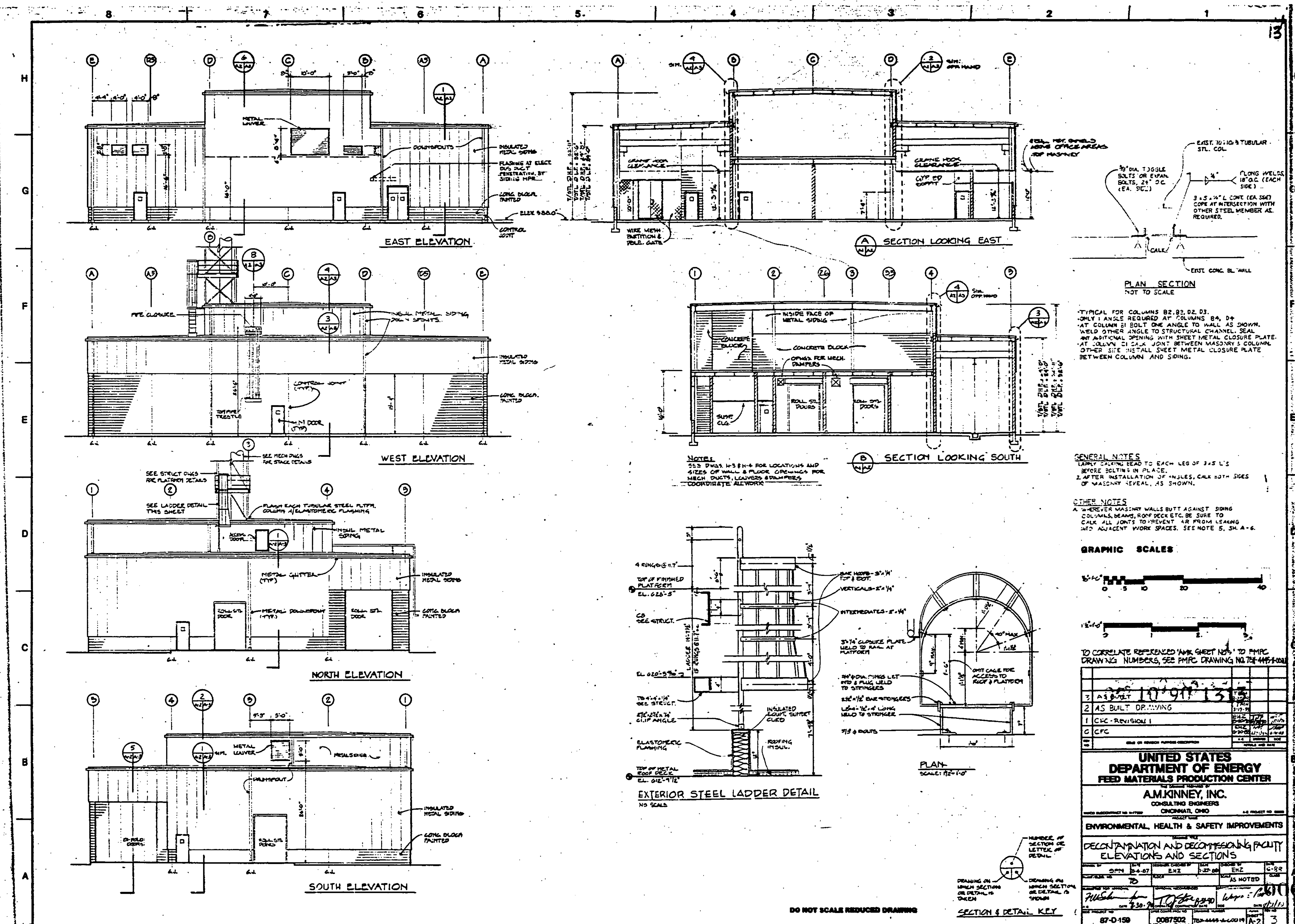
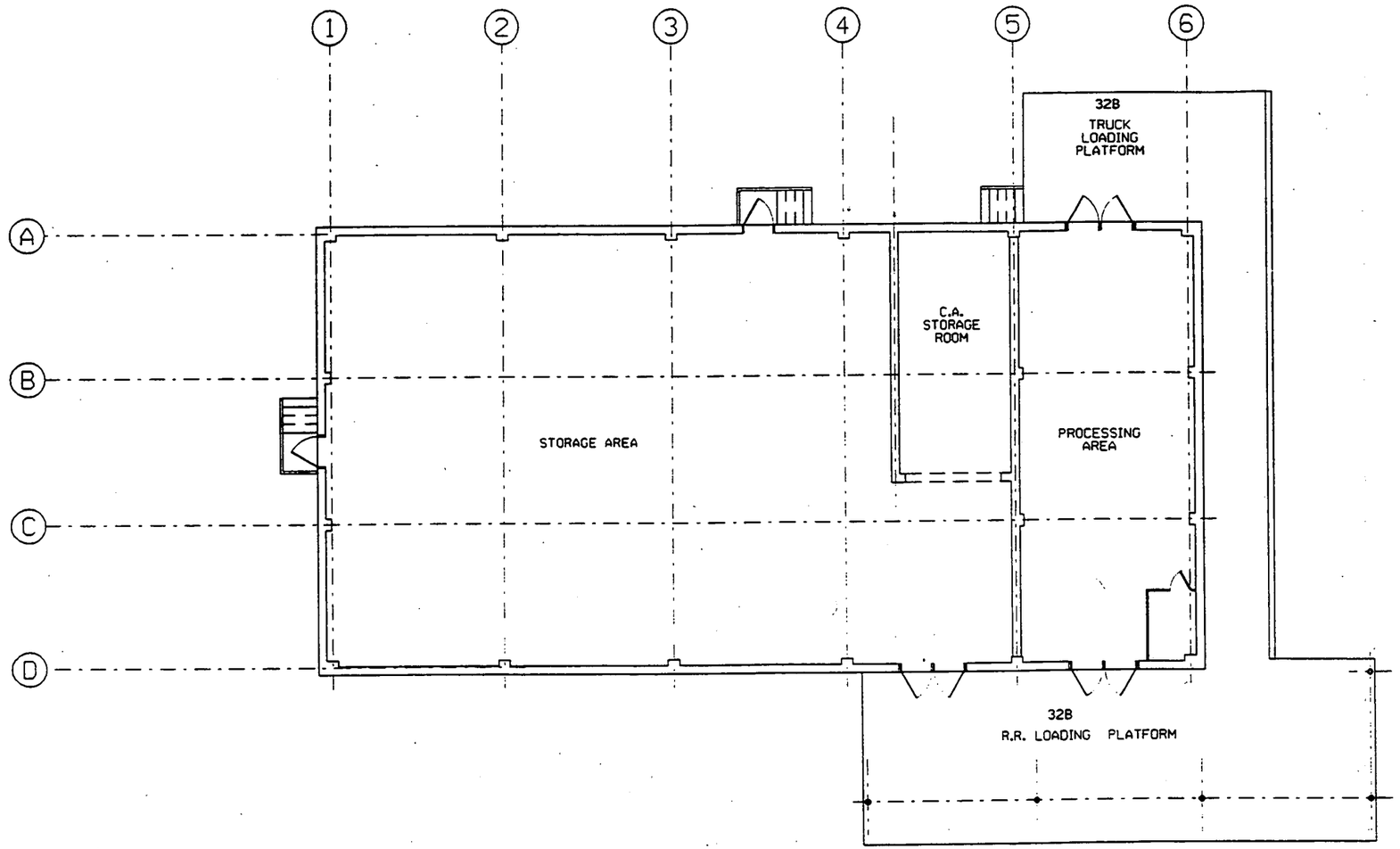


FIGURE D-12 Elevation Views Building 69



FERNALD ENVIRONMENTAL
RESTORATION MANAGEMENT
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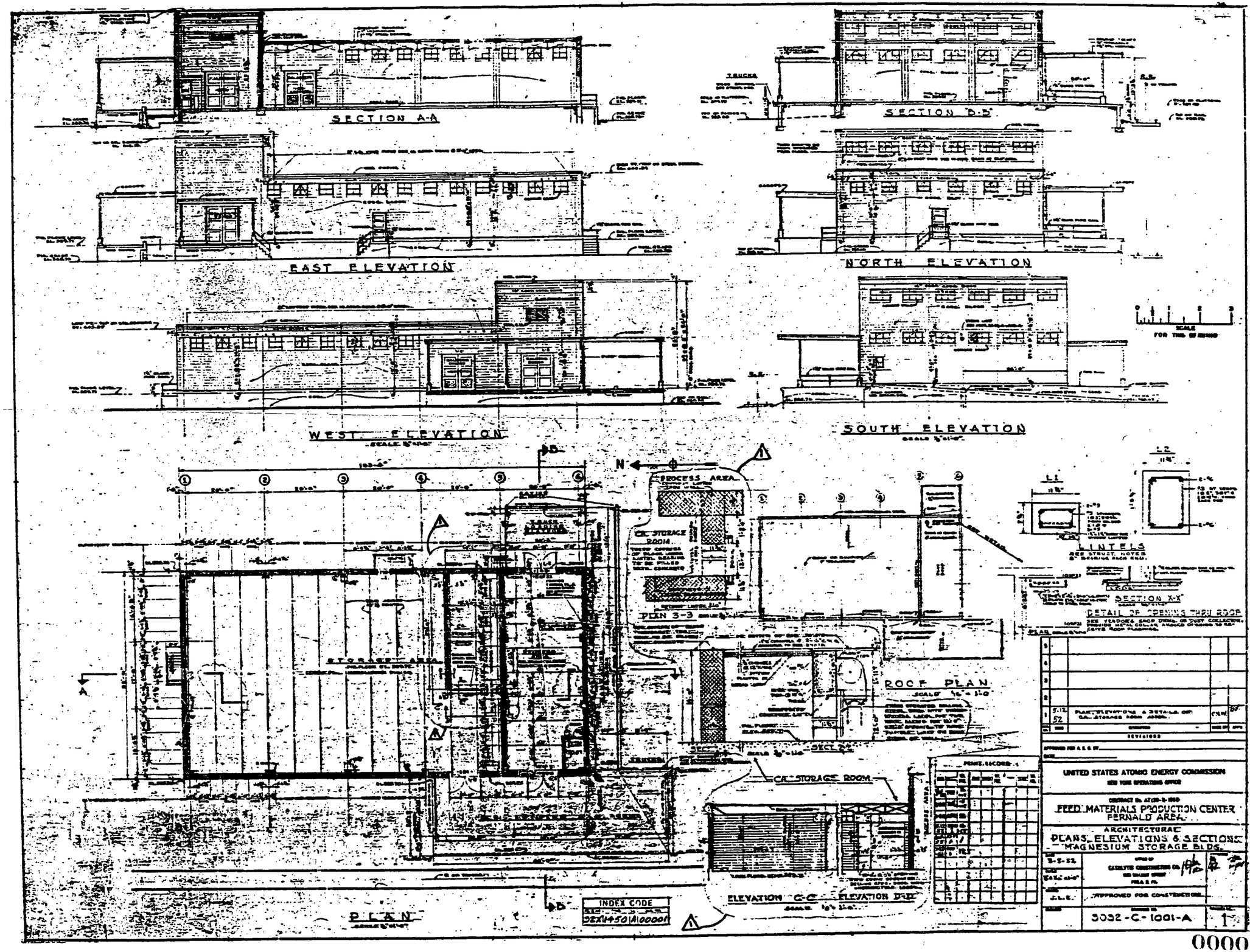
Fernald
Environmental Management Project
U.S. DEPARTMENT OF ENERGY

BUILDING 32A (& 32B) FIRST FLOOR
MAGNESIUM STORAGE BUILDING
FLOOR PLAN
1" = 10'

DATE 05-15-95
DRAWN R. Williams

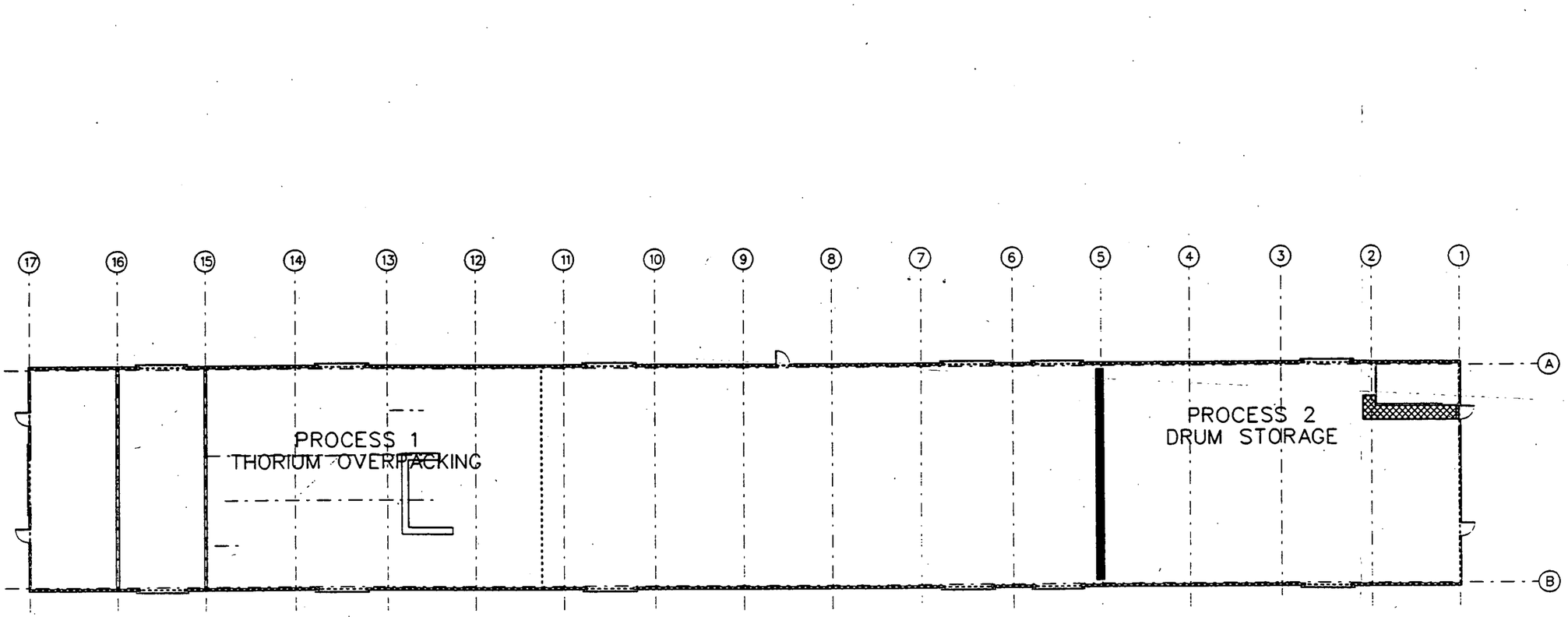
000075

FIGURE D-13 Floor Plan of Building 32A and Component 32B



000076

FIGURE D-14 Elevations of Building 32A and Component 32B



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
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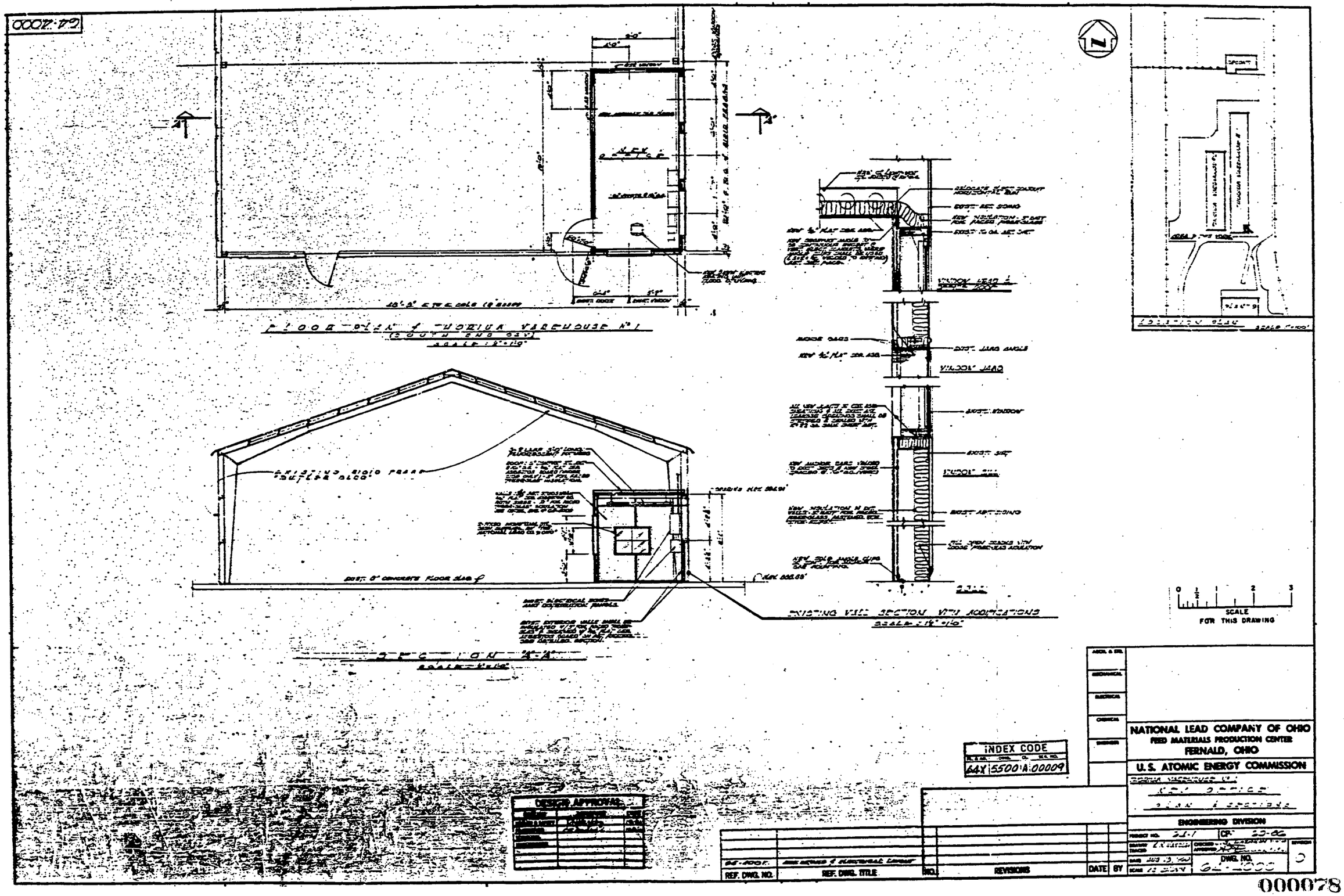
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

64 FIRST FLOOR
THORIUM WAREHOUSE
FLOOR PLAN
1" = 25'

DATE 04-10-95
DRAWN R. Williams

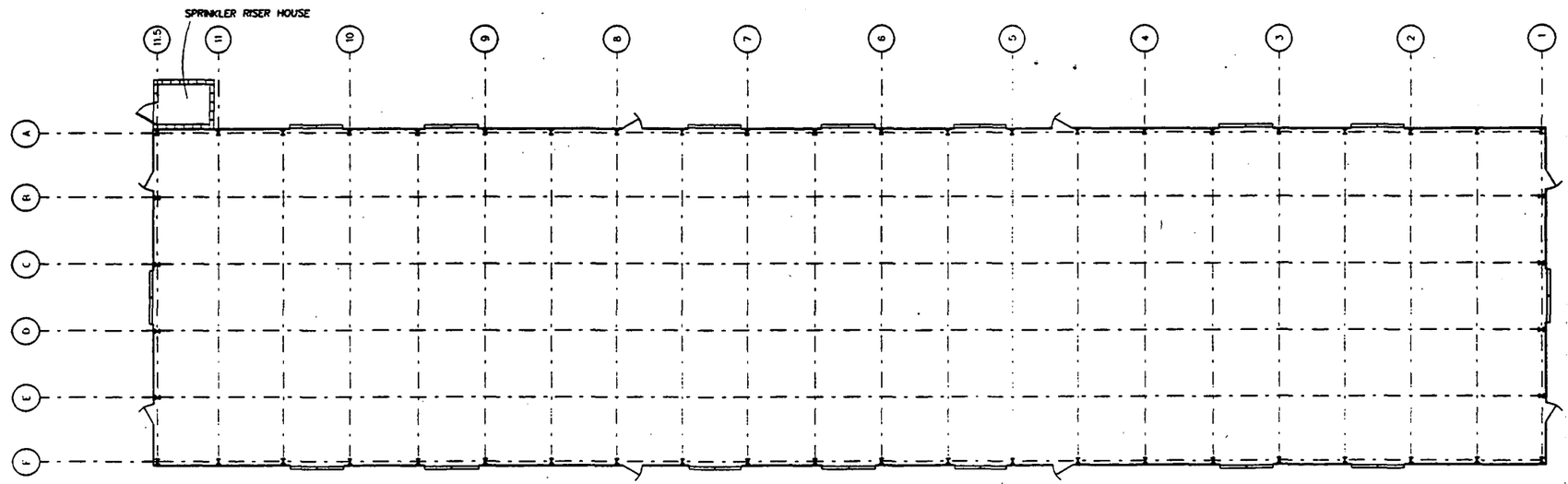
000077

FIGURE D-15 Floor Plan of Building 64



000078

FIGURE D-16 Plan and Sections of Building 64



FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

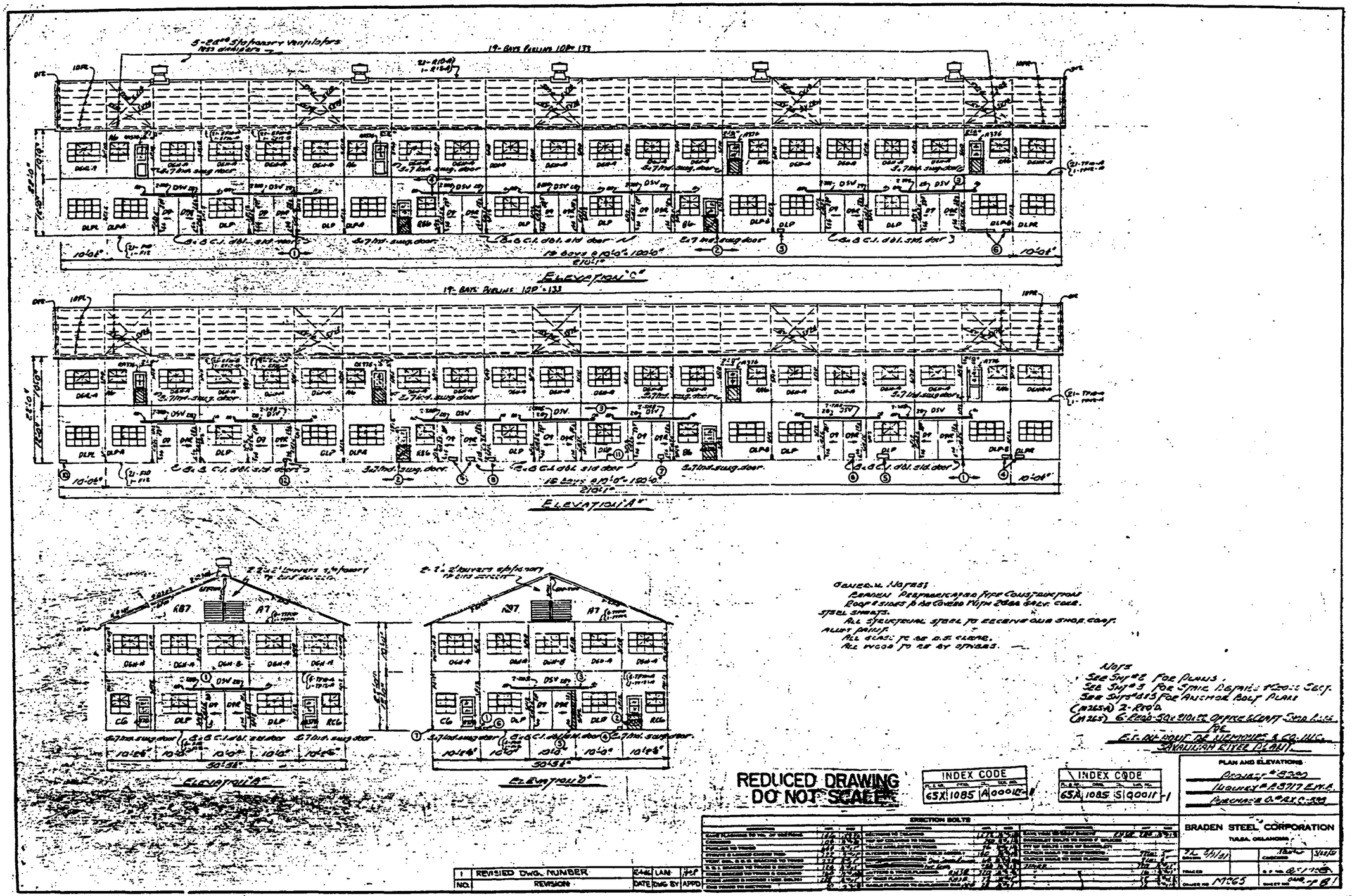
65 FIRST FLOOR

(OLD) PLANT 5 WAREHOUSE
FLOOR PLAN
1" = 20'

DATE 04-10-95
DRAWN R. Williams

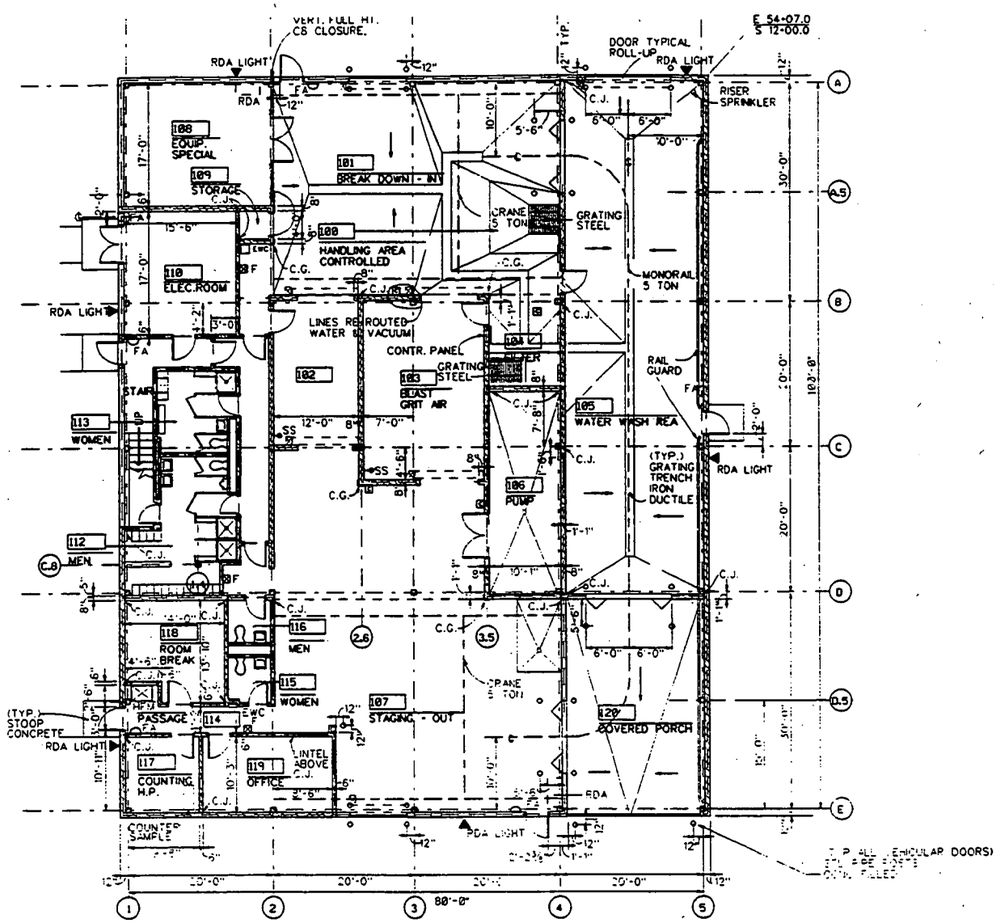
000079

FIGURE D-17 Floor Plan of Building 65



000080

FIGURE D-18 Elevations of Building 65



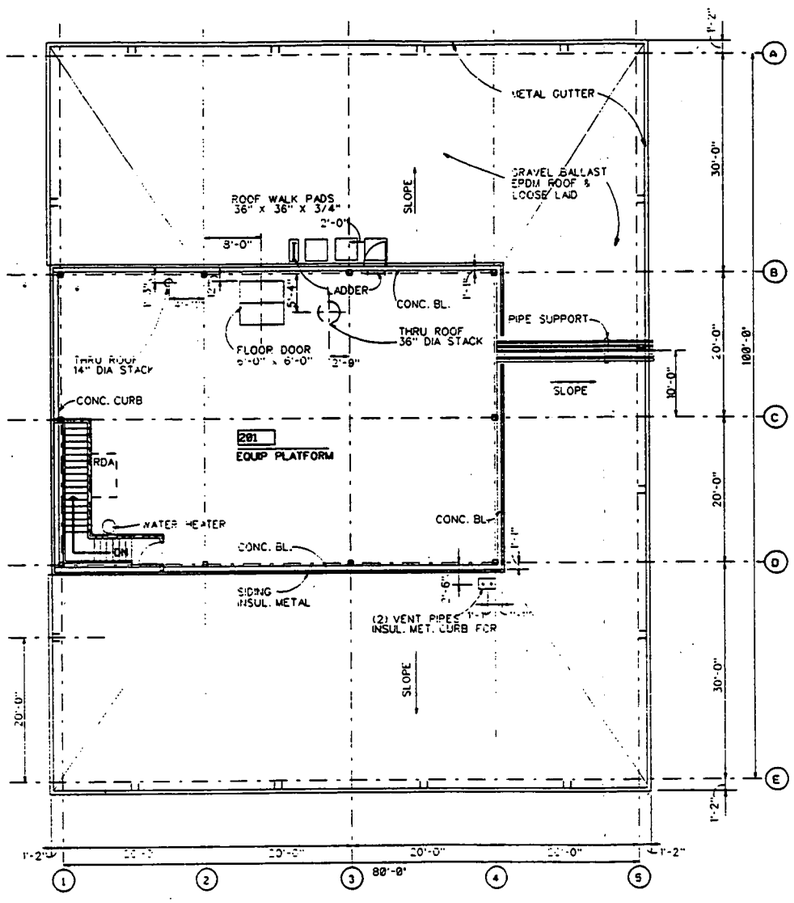
1/8"=1'-0"

FLOOR PLAN

EL. 588'-0"

SEE STRUCTURAL DRAWINGS FOR EPOXY TOPPING, SUMPS, 1/4" FLOOR DEPRESSION FOR SLOPES, TRENCHES, OPENINGS.

FLOOR NOTE:



1/8"=1'-0"

PLATFORM LEVEL PLAN

CORNER GUARD (C.G.)
CONCRETE
STEEL
BATT INSULATION
BOARD INSULATION
CONCRETE BLOCK
SAFETY SHOWER
PULL STATION FIRE ALARM
OF MOTOR OPERATOR INDICATES LOCATION
ROLL STL. DOOR
(N) MASONRY WALLS: CONTROL JOINT

LEGEND

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION

FERMCO

Fernald Environmental Management Project

U.S. DEPARTMENT OF ENERGY

78 FIRST FLOOR

D & D BUILDING
FLOOR PLAN
1" = 20'

DATE 03-17-95
DRAWN R. Williams

000081

FIGURE D-19 Floor Plan of Building 78

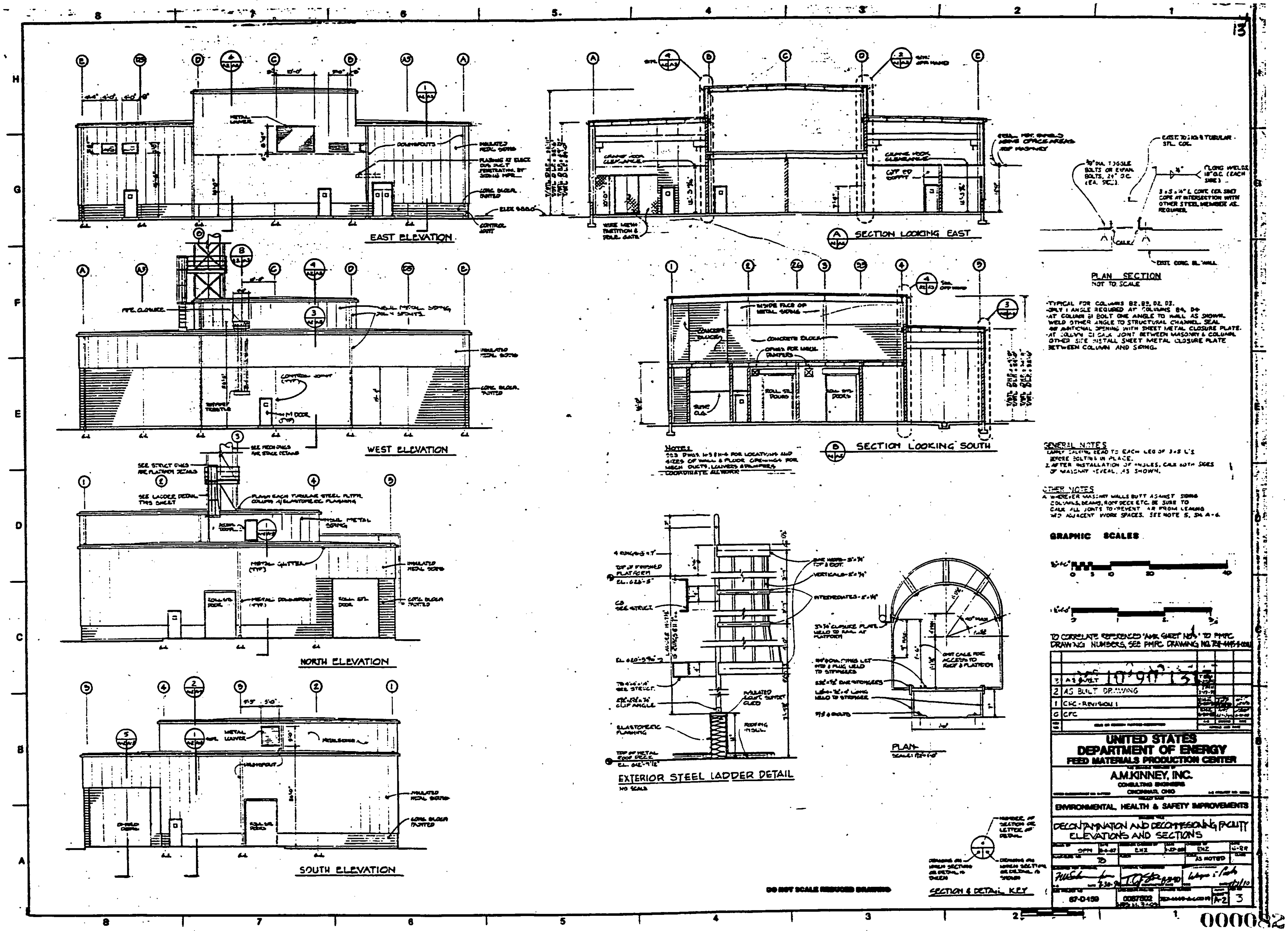


FIGURE D-20 Elevations of Building 78

APPENDIX E

PHOTOGRAPHS

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APPENDIX E

PHOTOGRAPHS

[1] Equipment and/or materials shown in photograph have been removed.

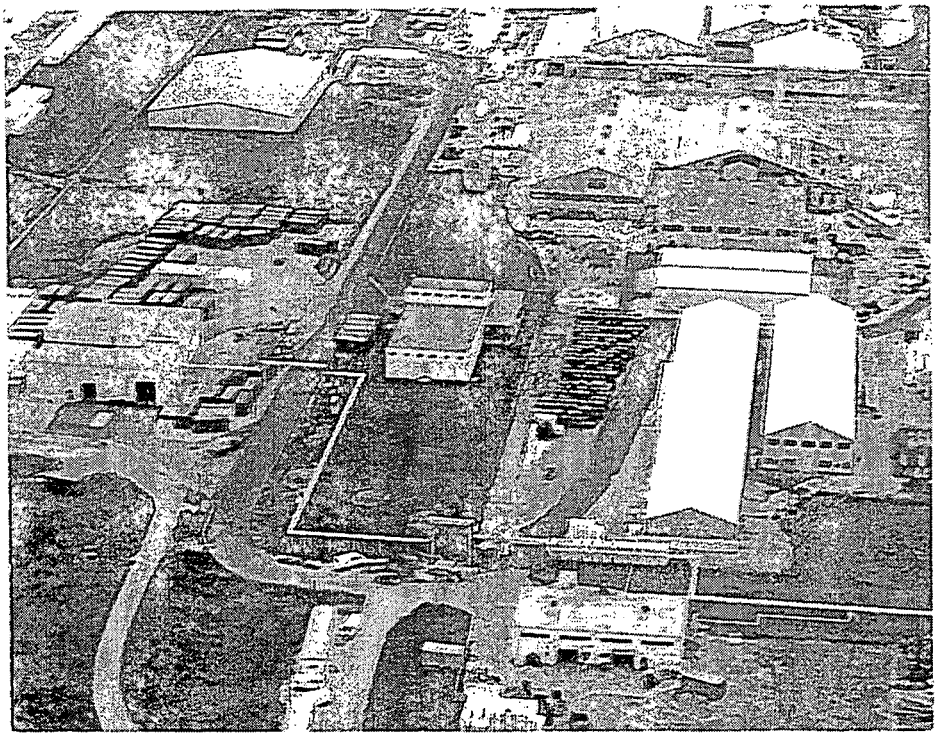

FIGURE E-1 Aerial View of Thorium/Plant 9 Complex, Facing South

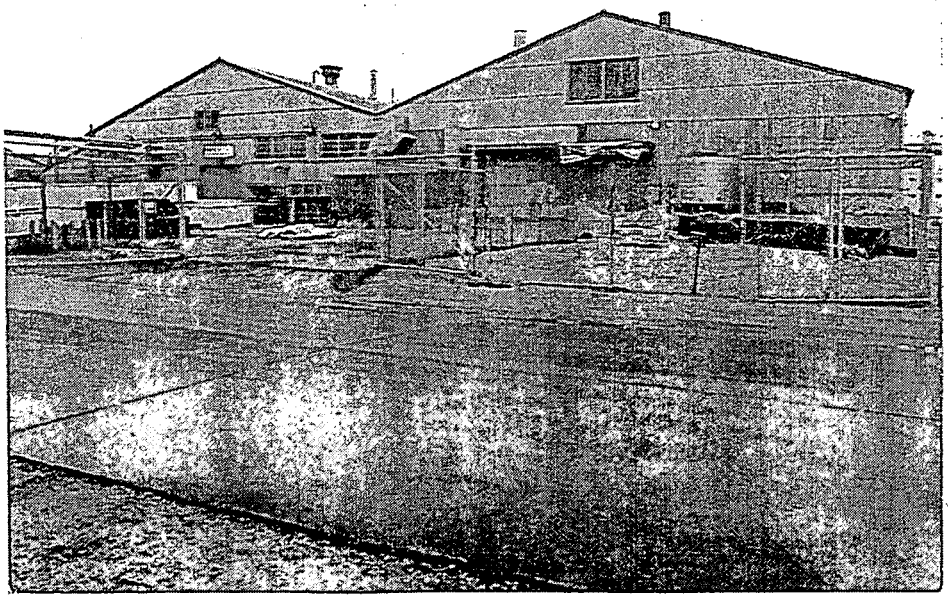

FIGURE E-2 Building 9A - South Elevation

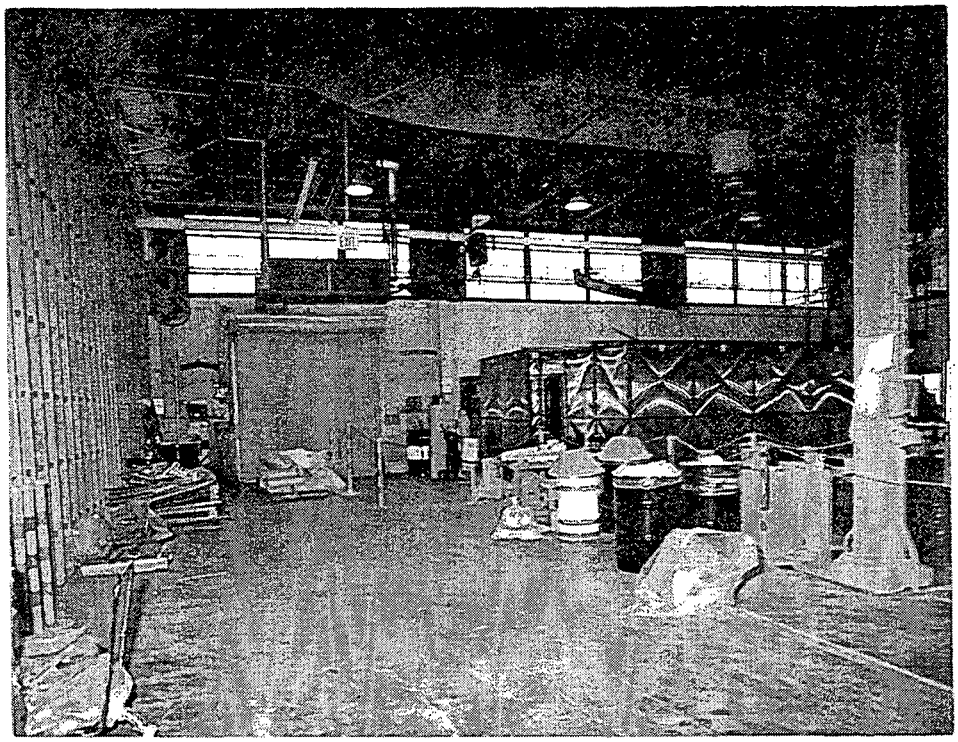

FIGURE E-3 Building 9A - Zirnlo Decladding Process Area, Facing North

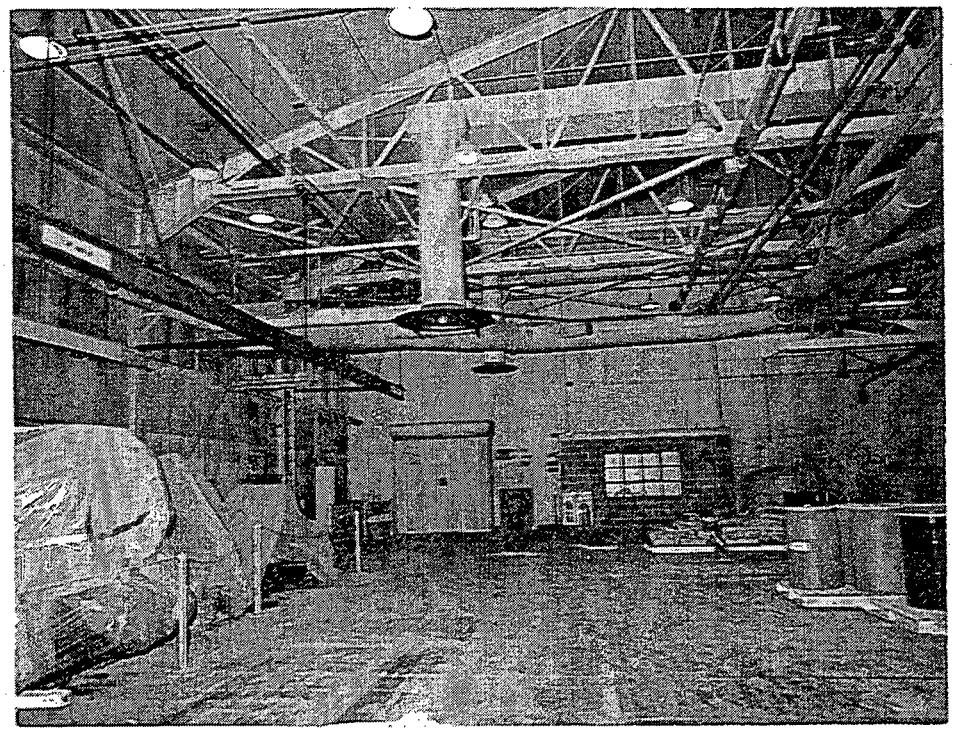

FIGURE E-4 Building 9A - Uranium Machining Area, Facing South

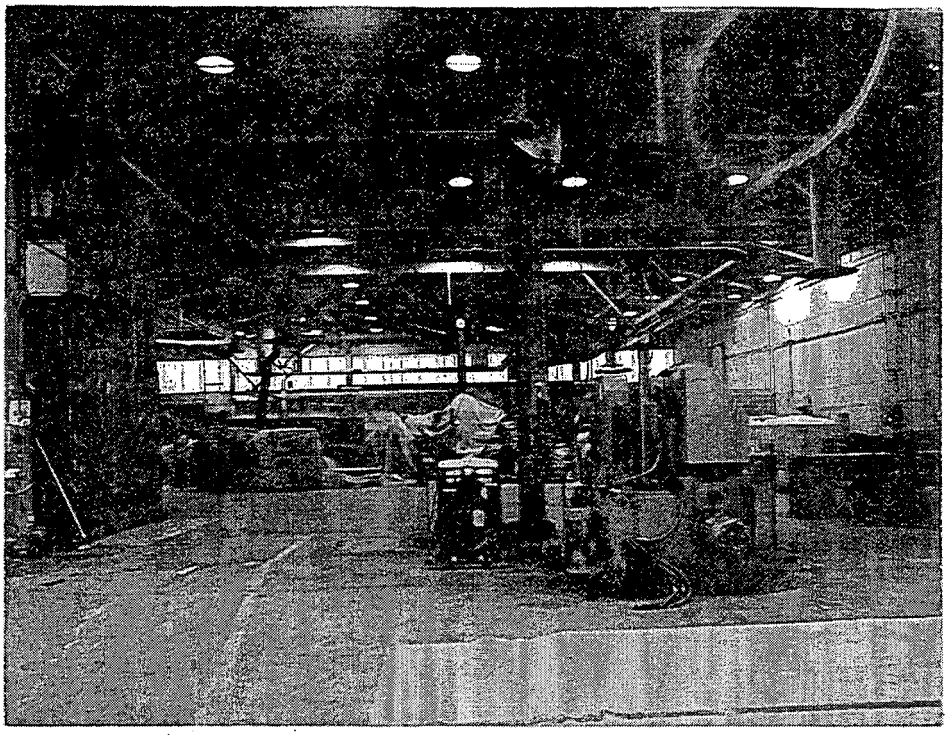

FIGURE E-5 Building 9A - Casting and Machining Area, Facing East

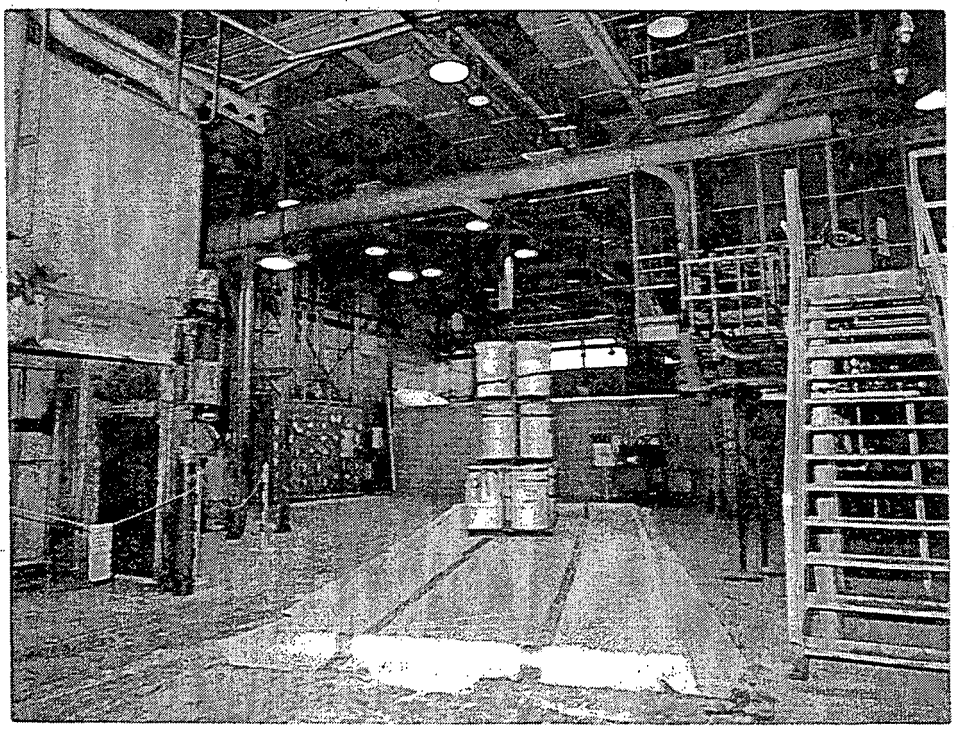

FIGURE E-6 Building 9A - Uranium Casting/Ingot Processing Area, Facing South

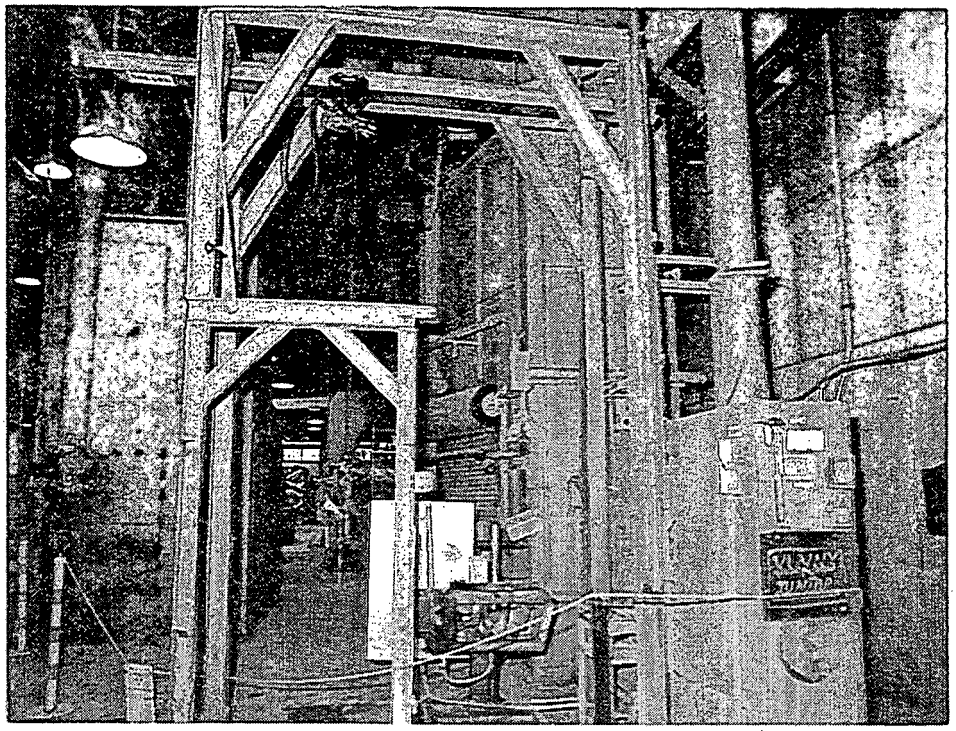

FIGURE E-7 Building 9A - Ingot Cooling and Separation Booth Controls

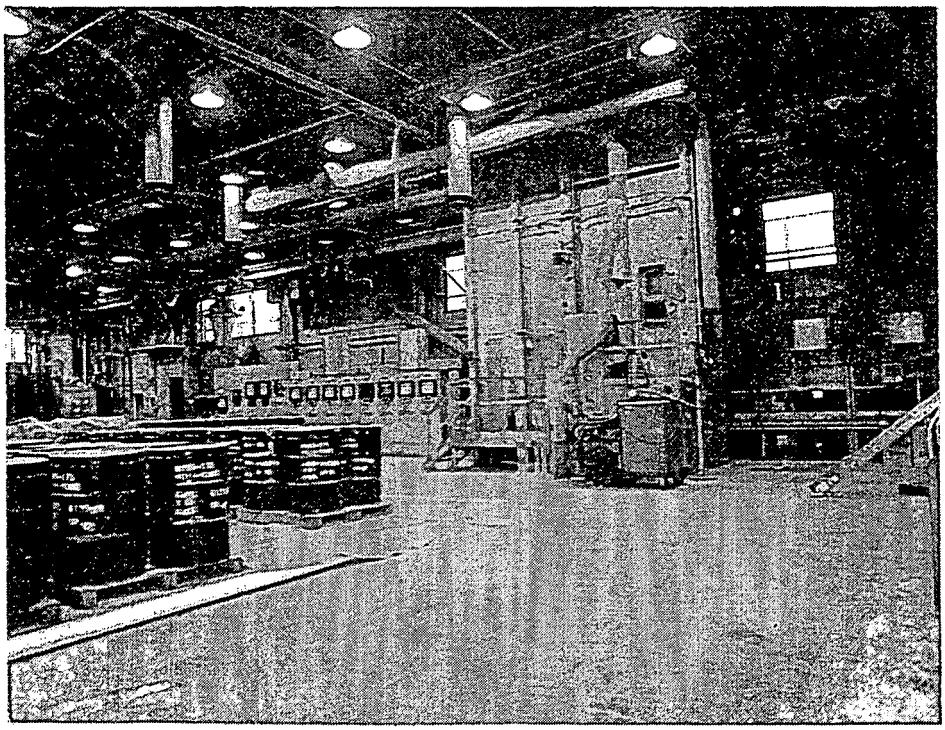

FIGURE E-8 Building 9A - Uranium Production Area, Derby Breakout Station

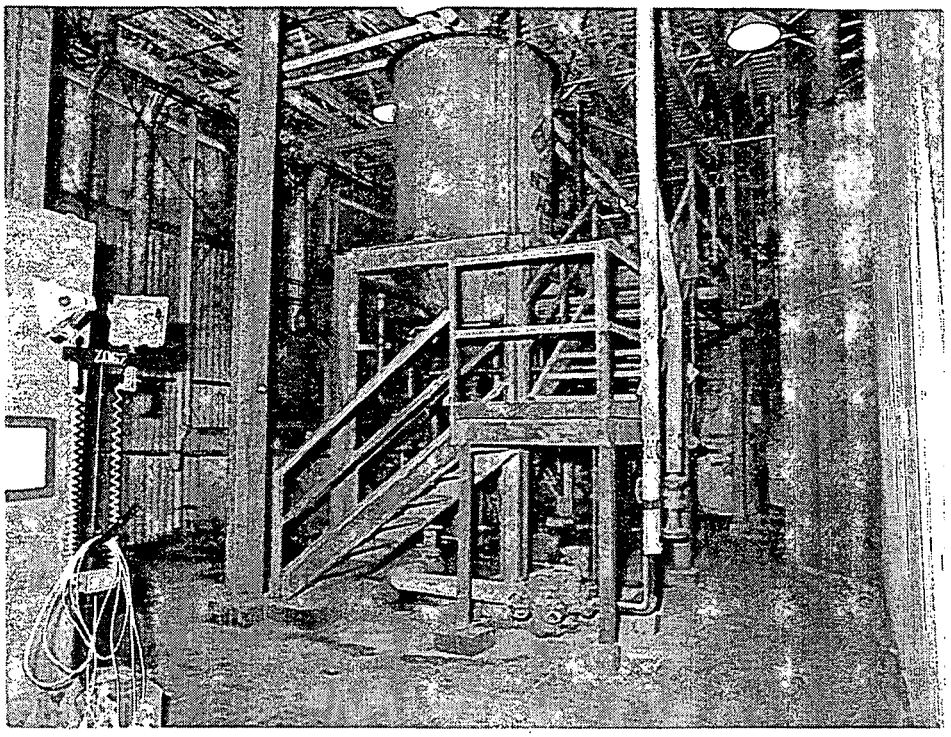

FIGURE E-9 Building 9A - Zirnlo Decladding Area, Acid Tank

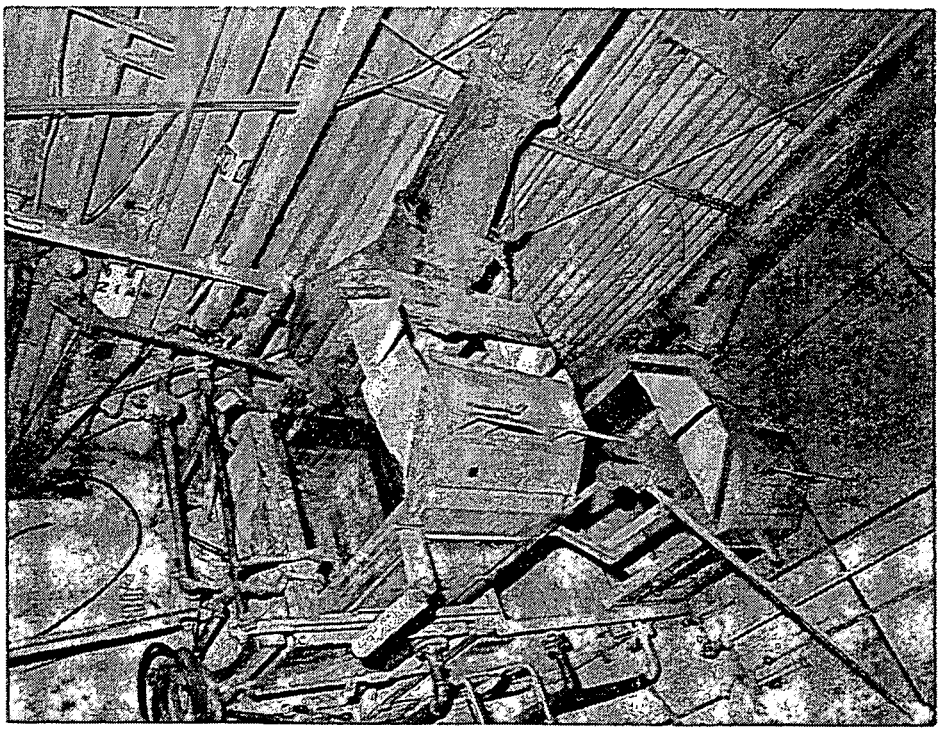

FIGURE E-10 Building 9A - Zirnlo Decladding, Dezirc and Pickle Rinse Tanks

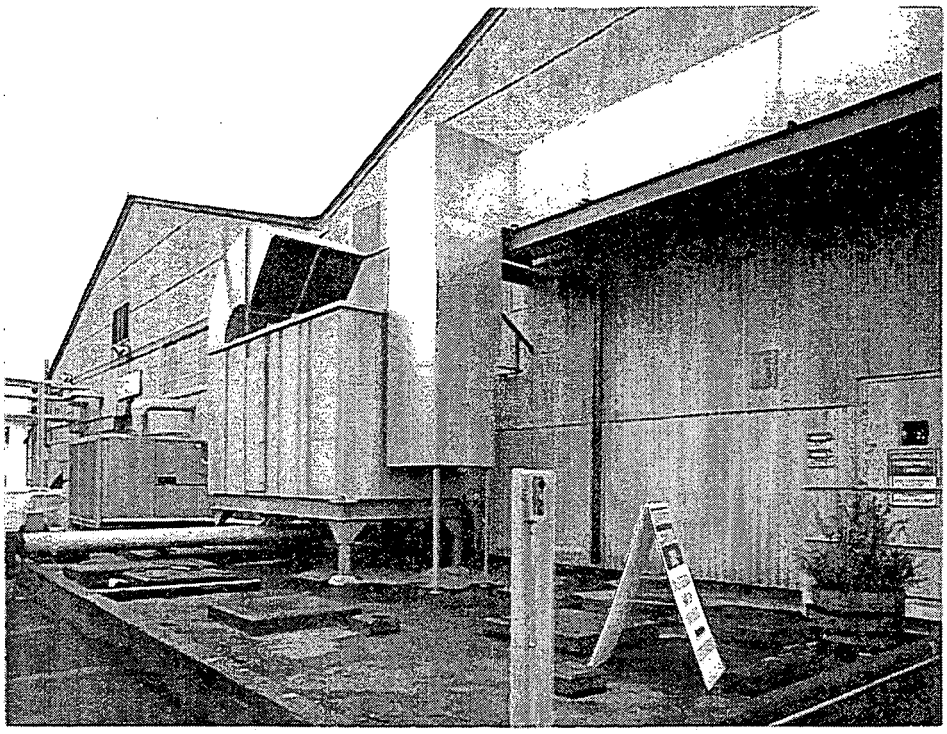

FIGURE E-11 Building 9A - South Elevation, Dust Collector

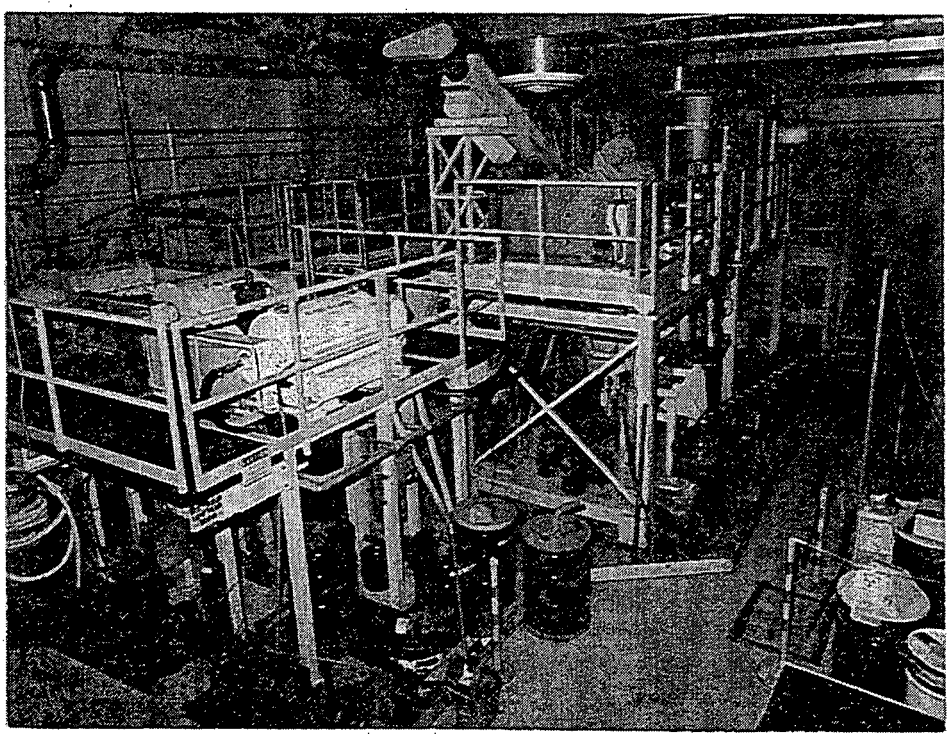

FIGURE E-12 Building 9A - MAWS Process Equipment

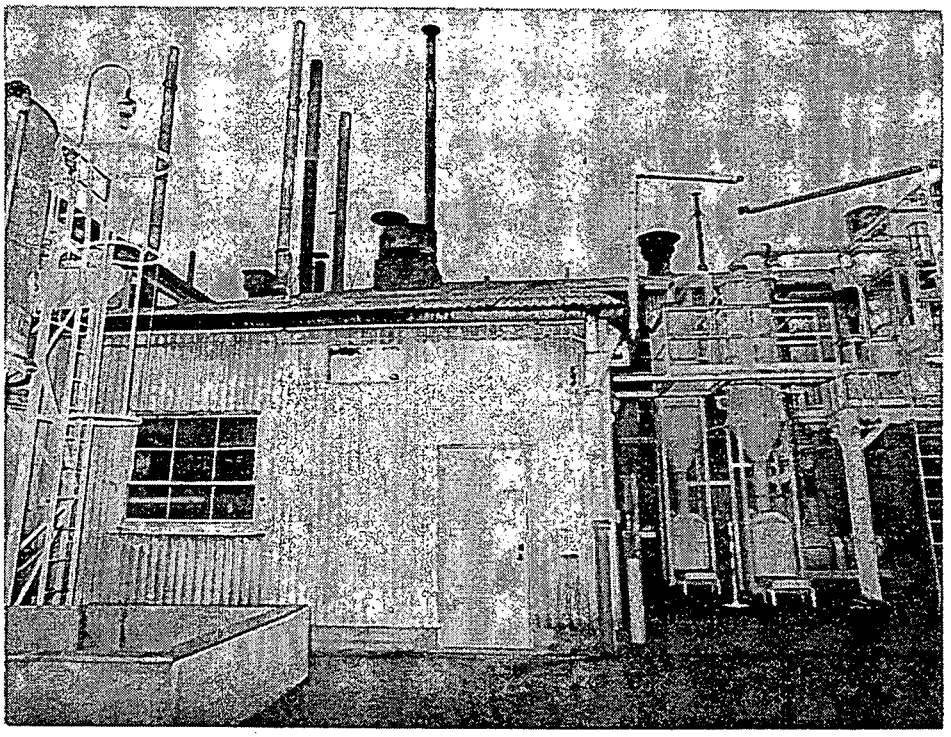

FIGURE E-13 Building 9B - West Elevation, Sump Treatment Facility

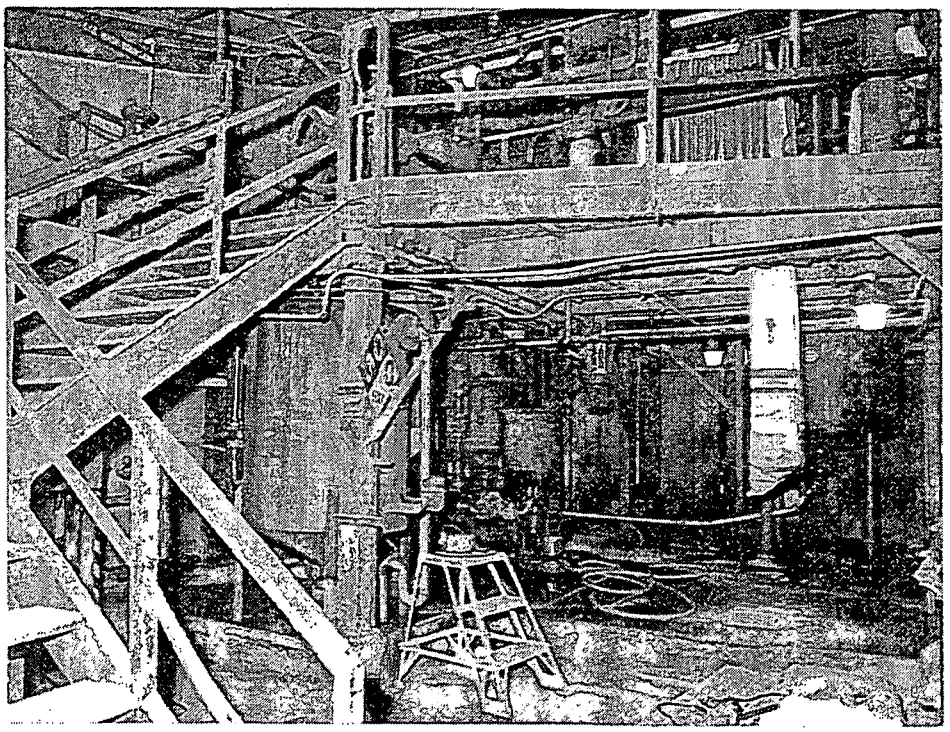

FIGURE E-14 Building 9B - Sump Treatment Tanks and Filter Press

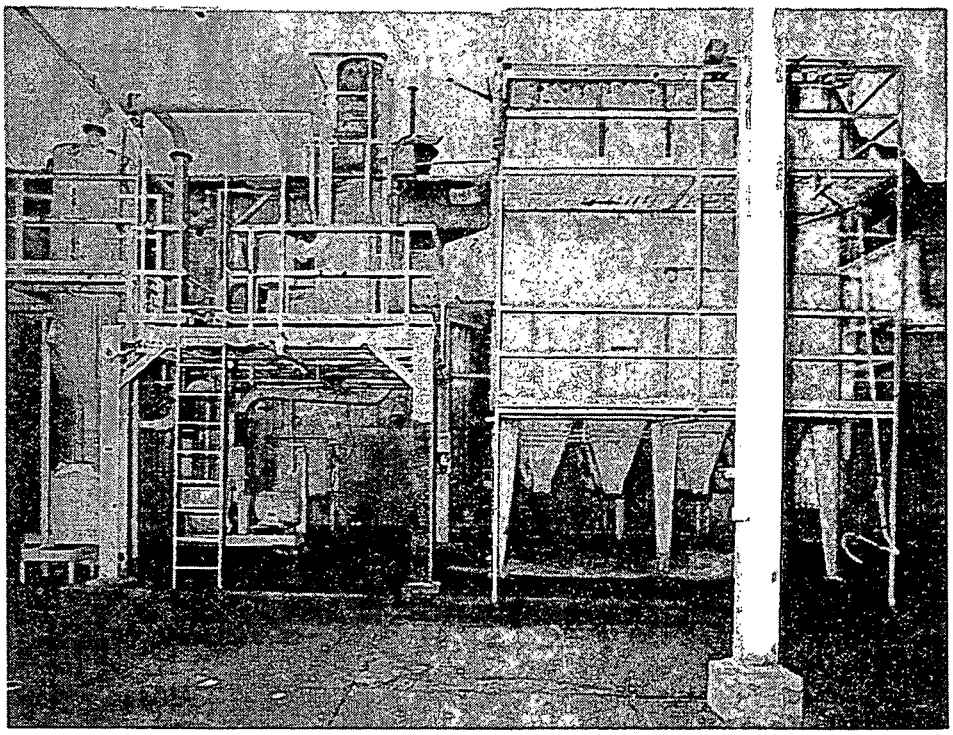

FIGURE E-15 Building 9C - Dust Collector, West Elevation

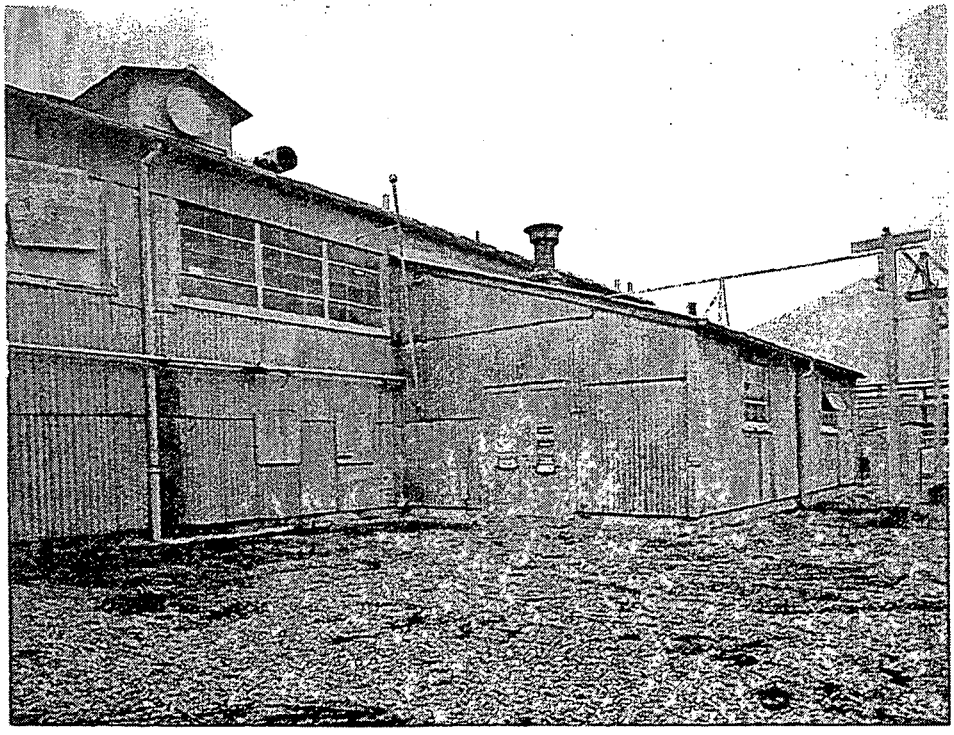

FIGURE E-16 Building 9D - Electrical Substation, Northwest Elevation

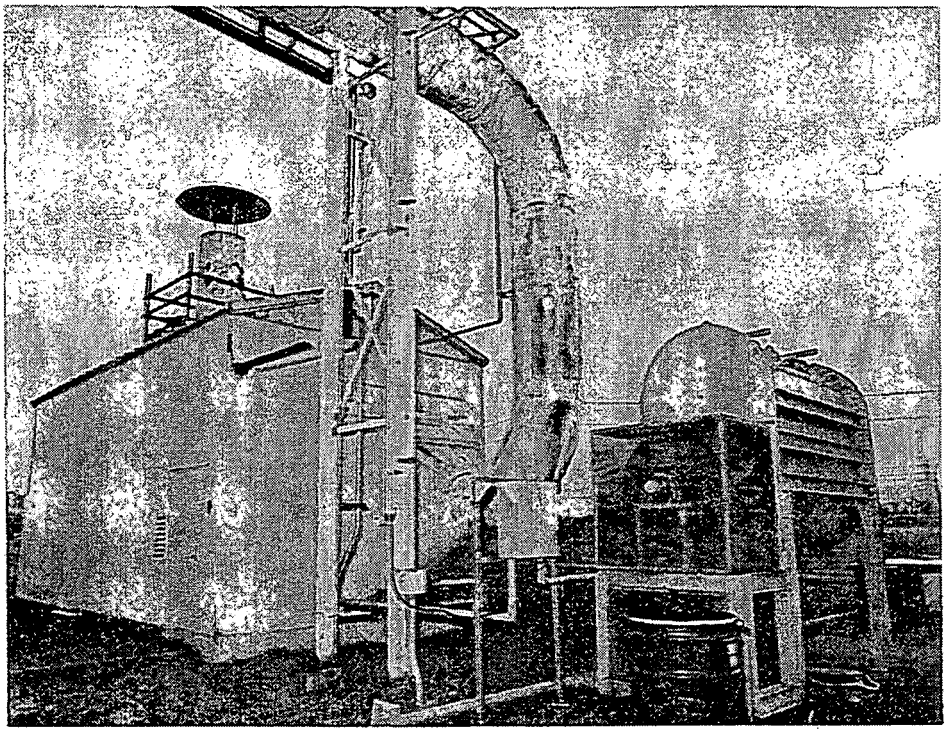

FIGURE E-17 Building 9F - Electrostatic Precipitator, Southwest Elevation

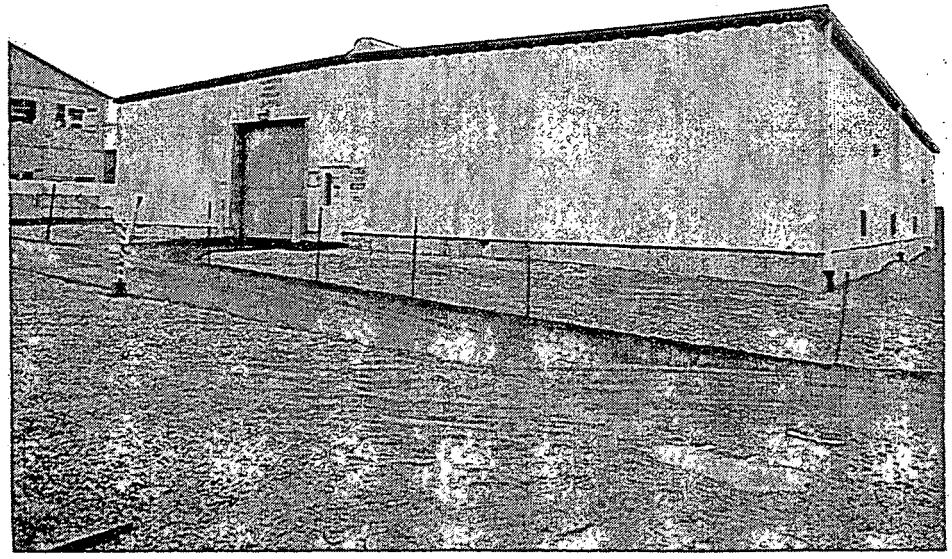

FIGURE E-18 Building 81 - West Elevation

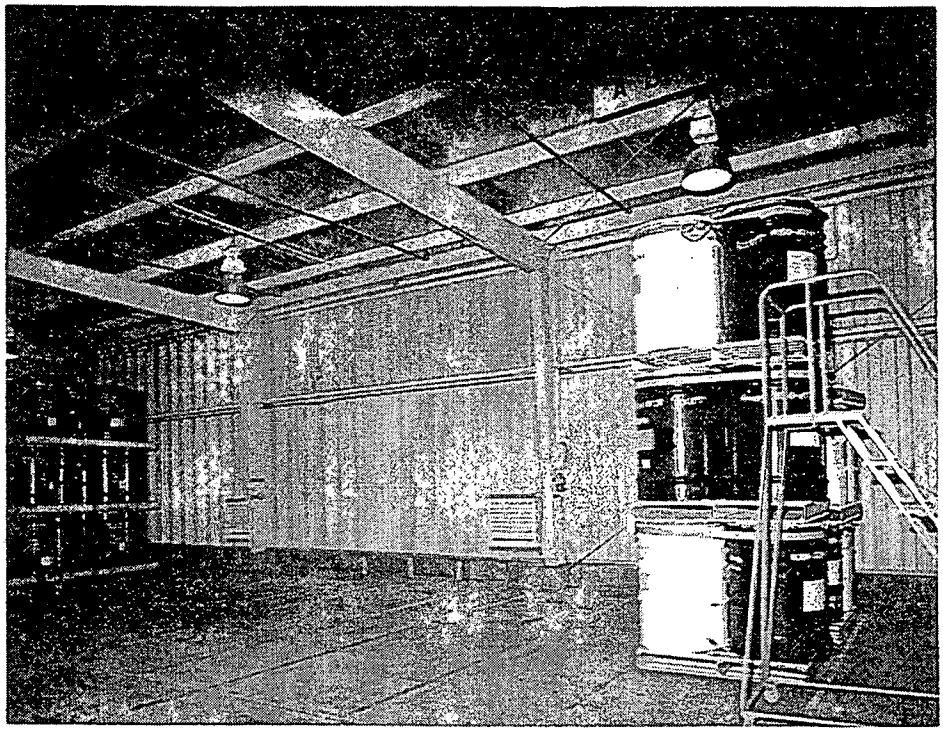

FIGURE E-19 Building 81 - Interior, North Wall

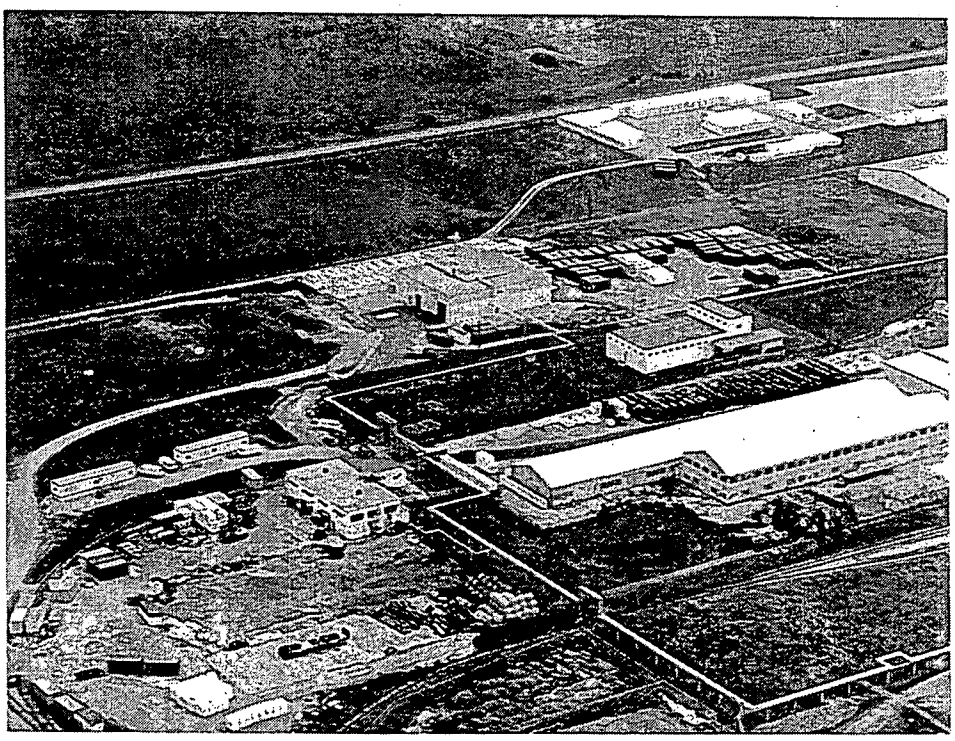

FIGURE E-20 Aerial View of Thorium Complex

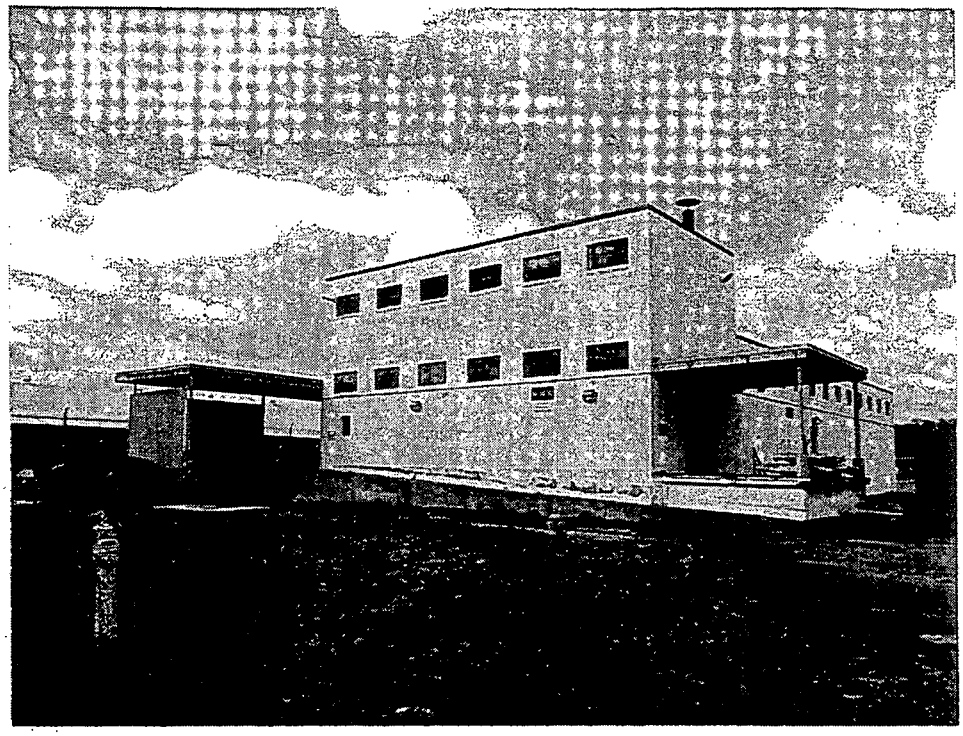

FIGURE E-21 Building 32A and 32B - Southeast Elevation

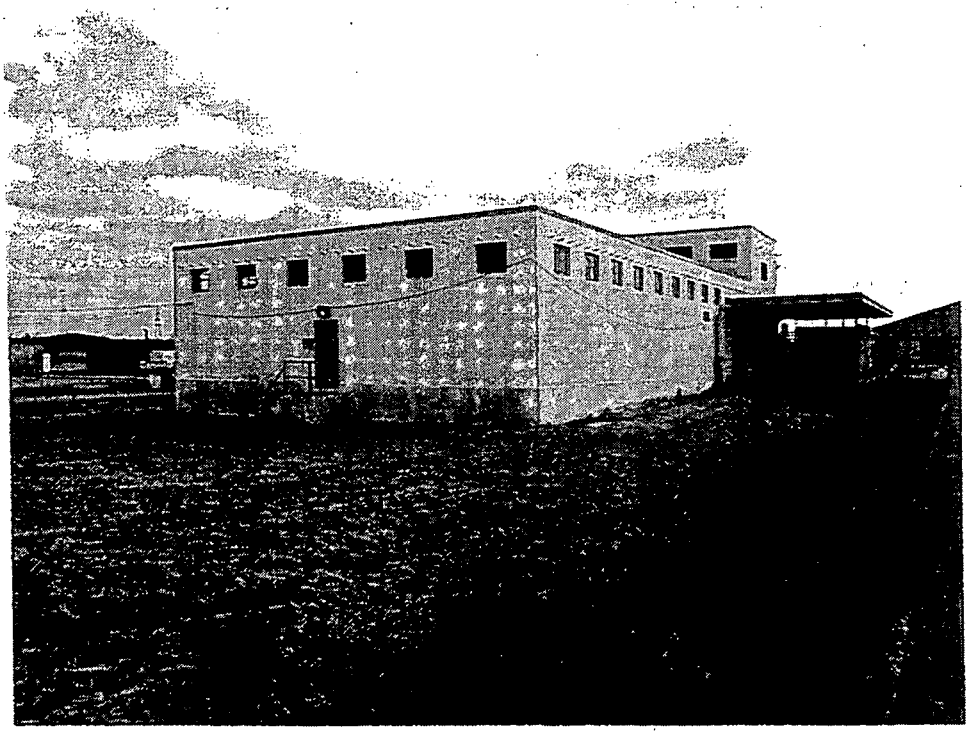

FIGURE E-22 Building 32A and 32B - Northwest Elevation

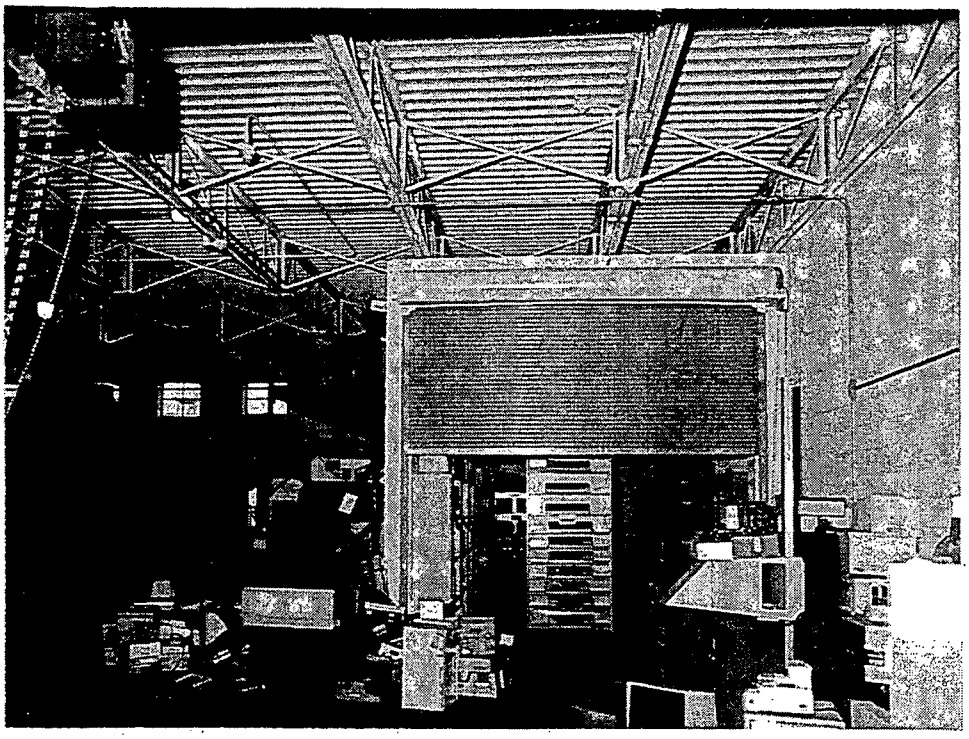

FIGURE E-23 Building 32A - Structural Steel, Overhead Door, Masonry Block

FIGURE E-24 Building 32A - Structural Steel and Corrugated Roofing

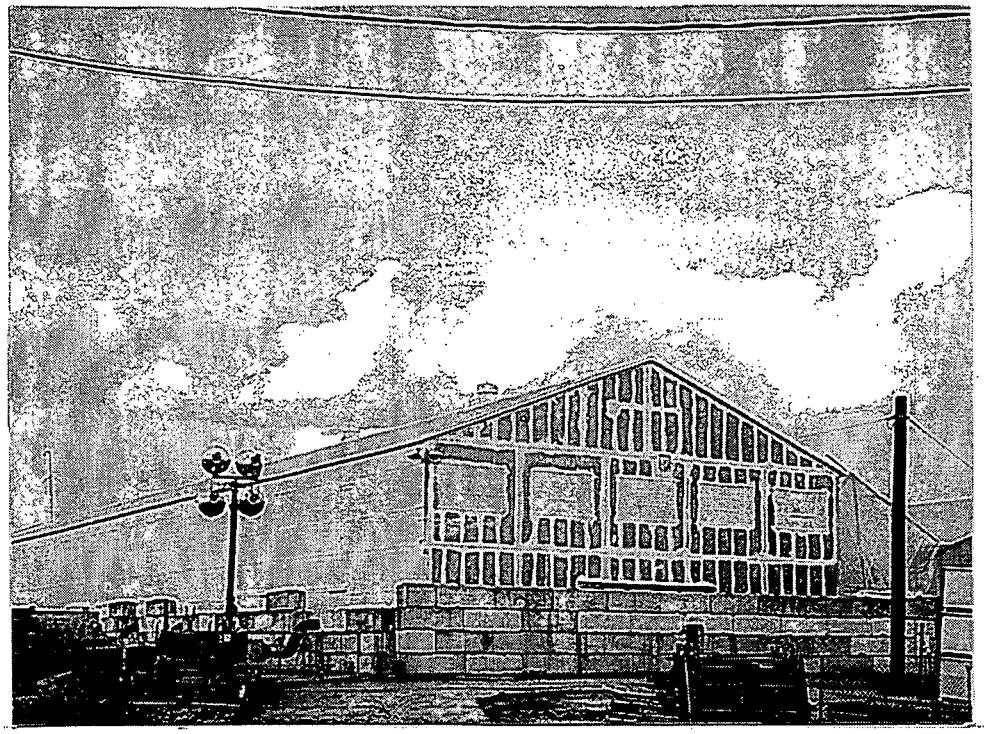

FIGURE E-25 Building 65 - South Elevation

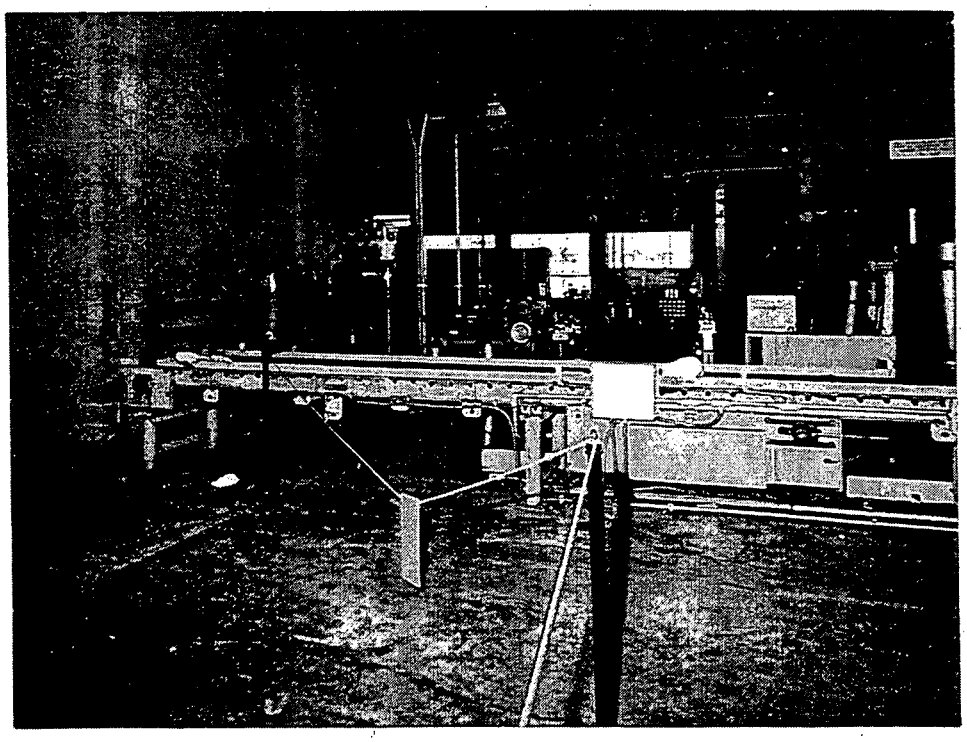

FIGURE E-26 Building 64 - Process Machines and Conveyor

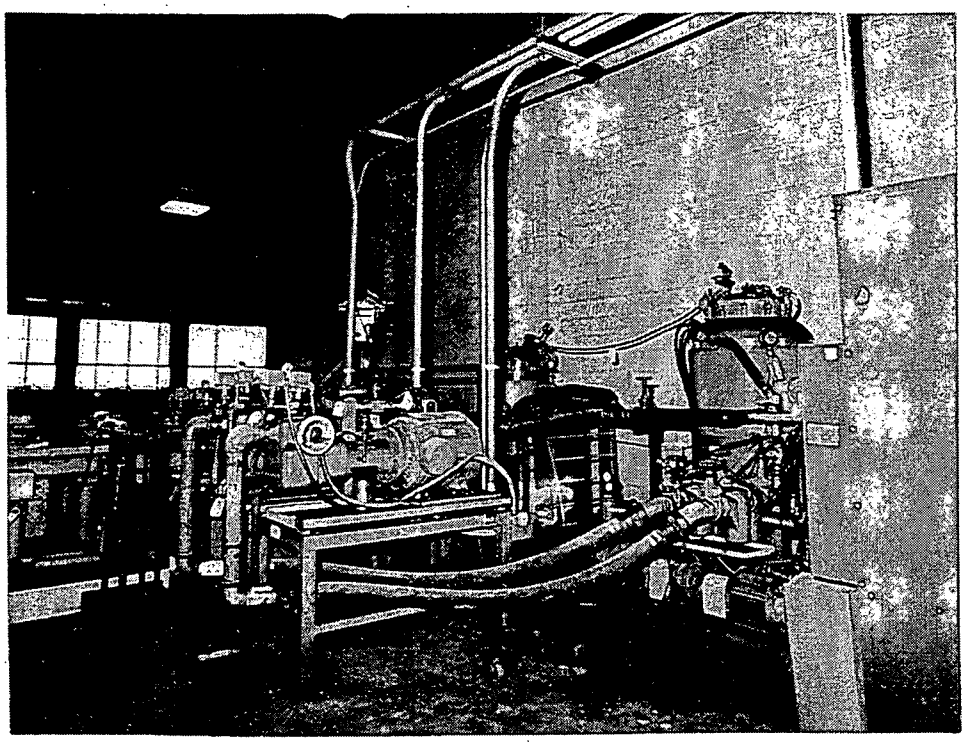

FIGURE E-27 Building 64 - Machine Units and Masonry Block

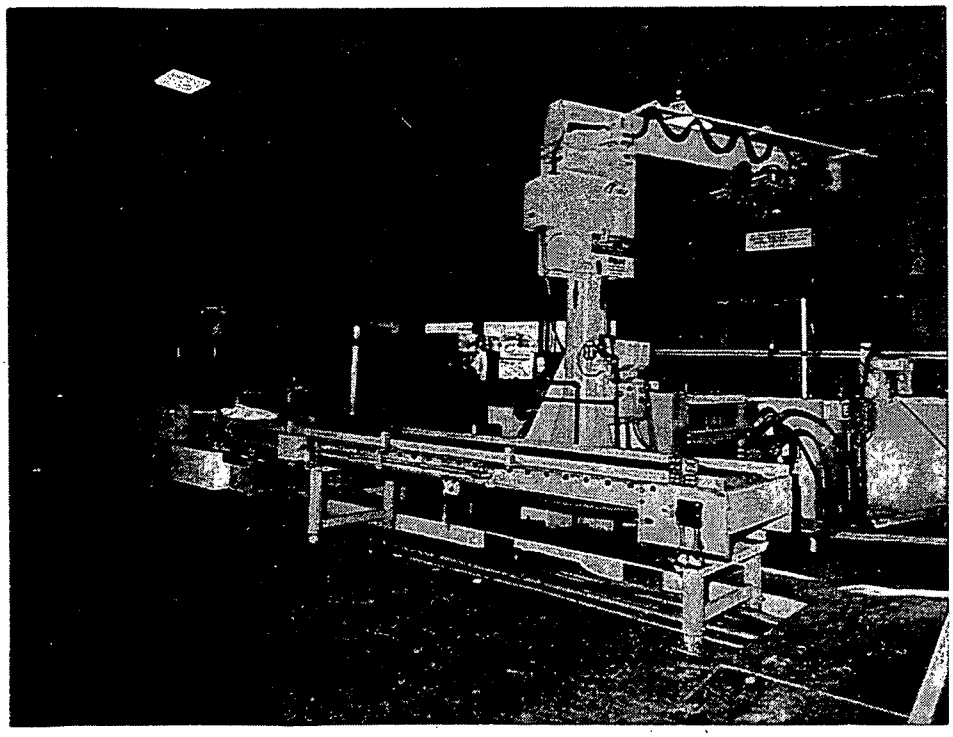

FIGURE E-28 Building 64 - Structural Crane and Conveyor

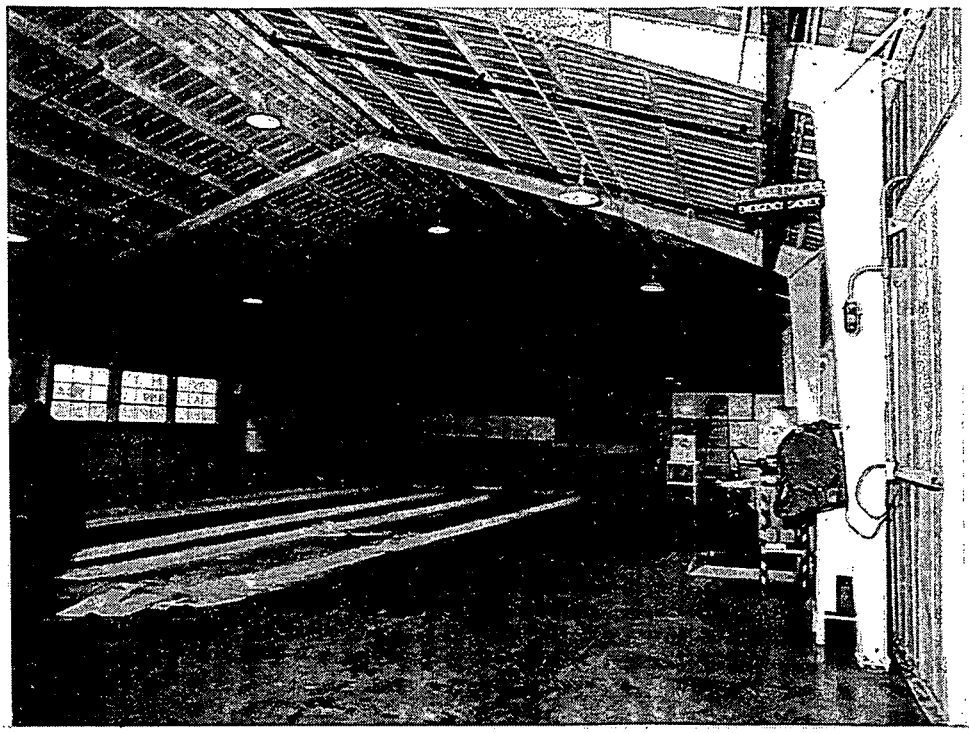

FIGURE E-29 Building 64 - Interior Structural Steel

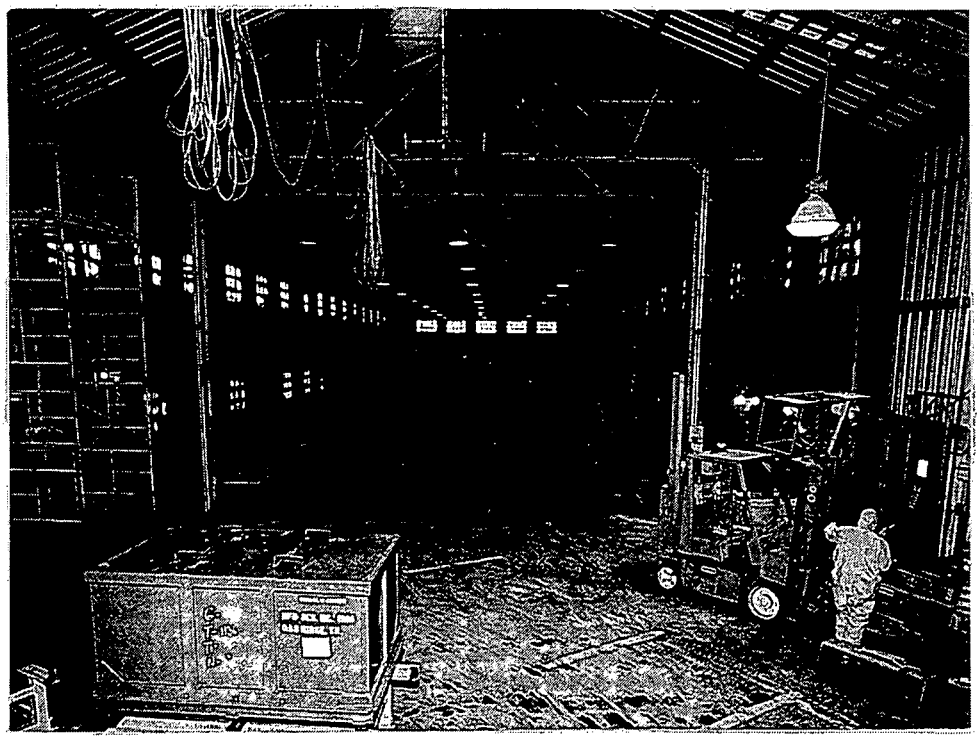

FIGURE E-30 Building 65 - Interior Structural Steel

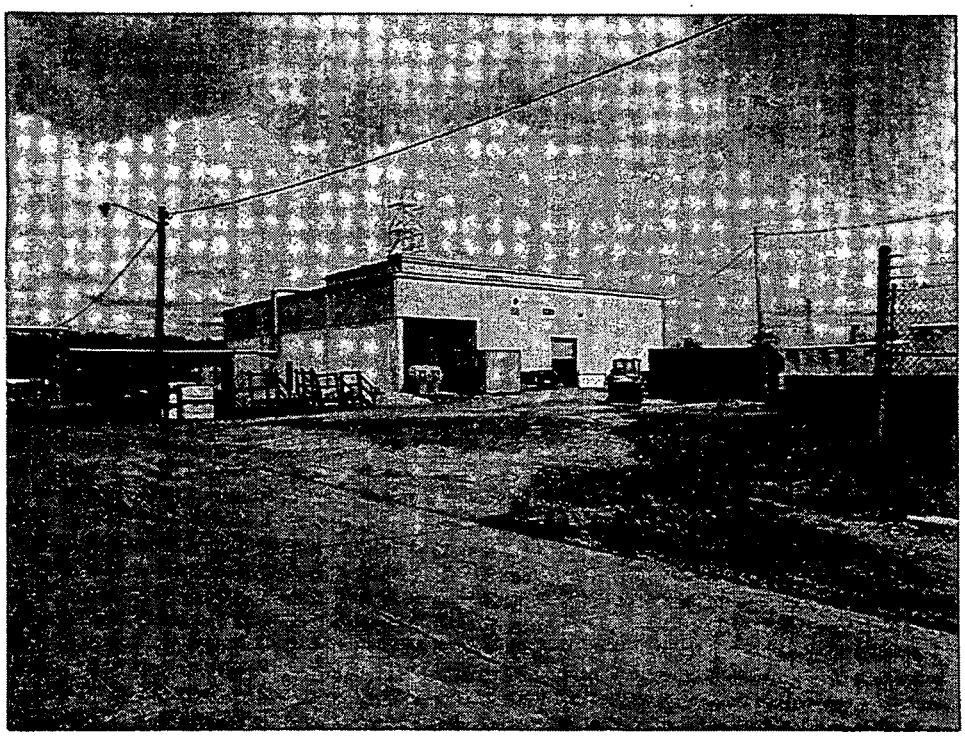

FIGURE E-31 Building 78 - Southwest Elevation

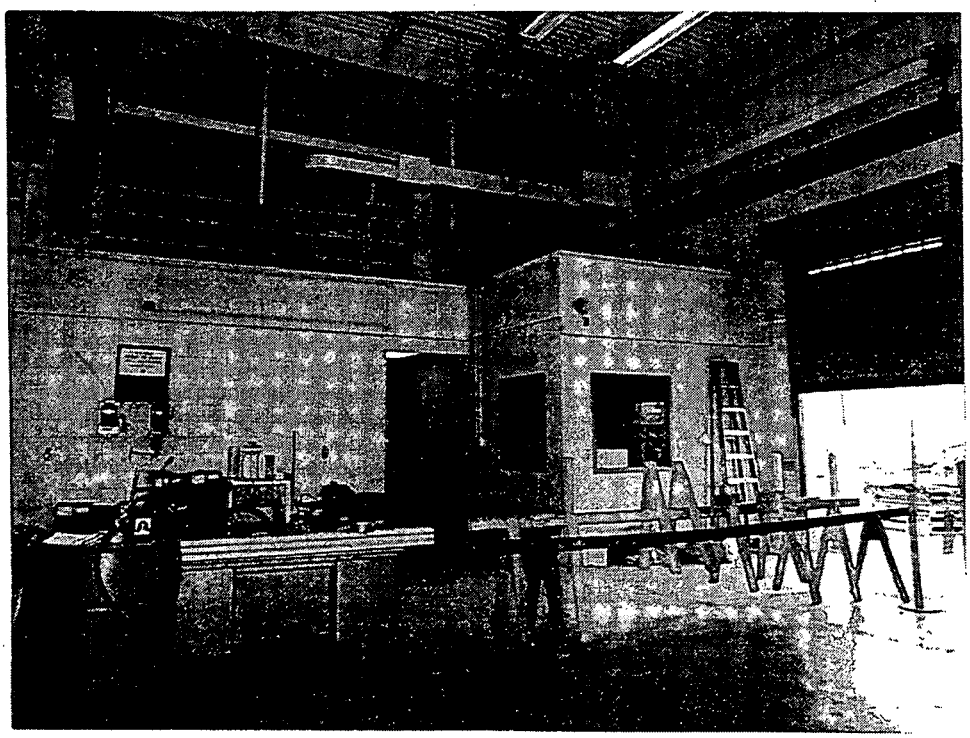

FIGURE E-32 Building 78 - First Floor, Office

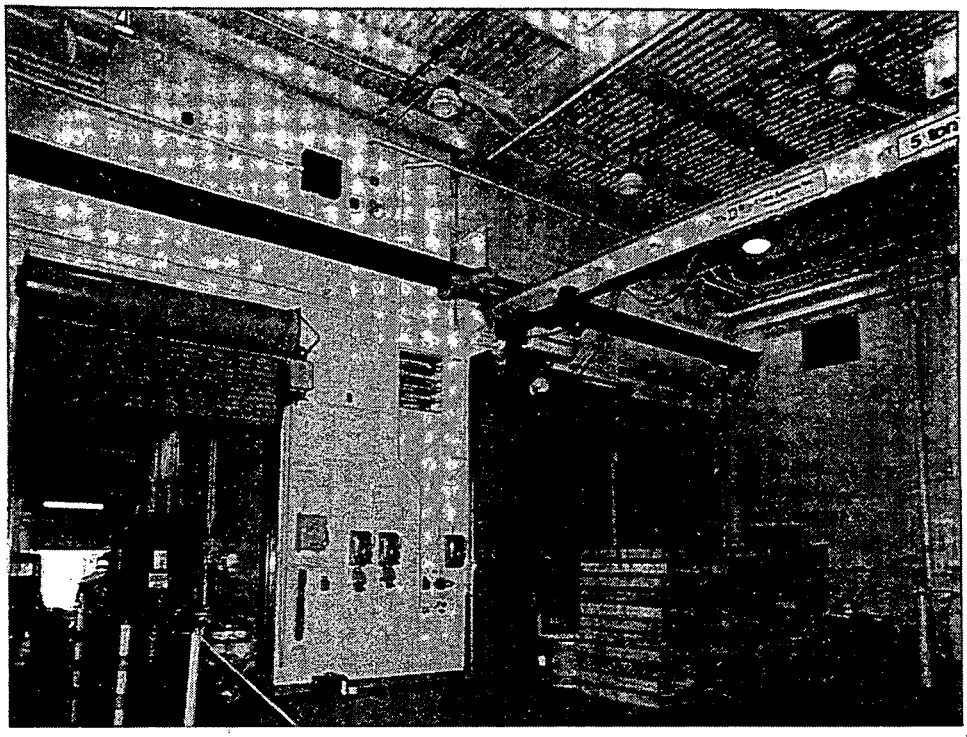

FIGURE E-33 Building 78 - First Floor, 5-Ton Crane and Roll-up Door

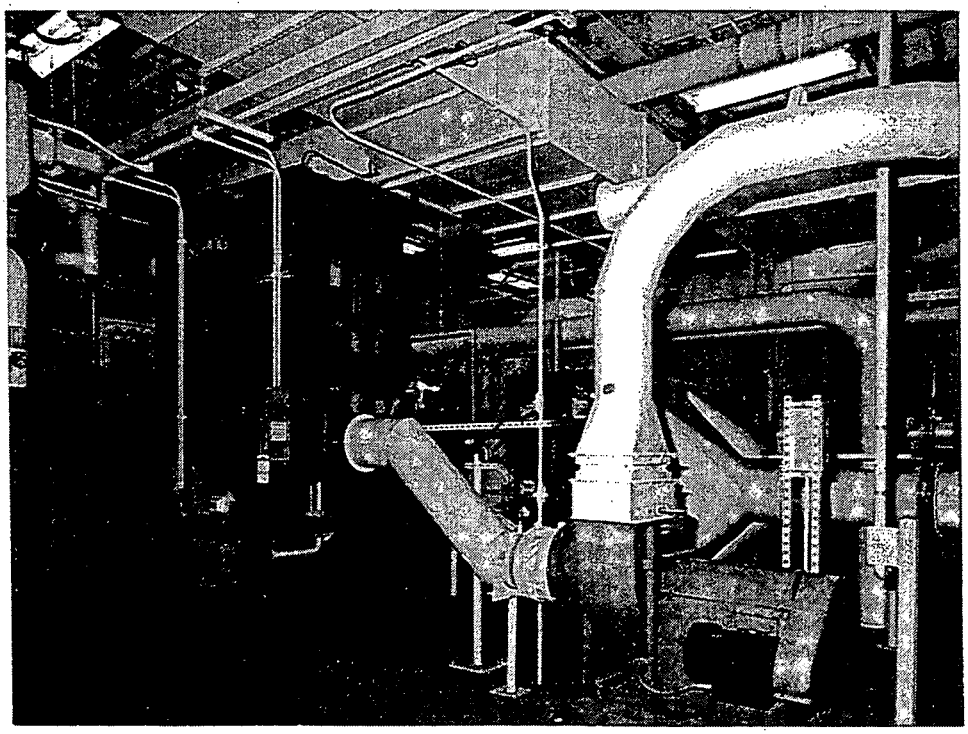

FIGURE E-34 Building 78 - Second Floor, Process Equipment

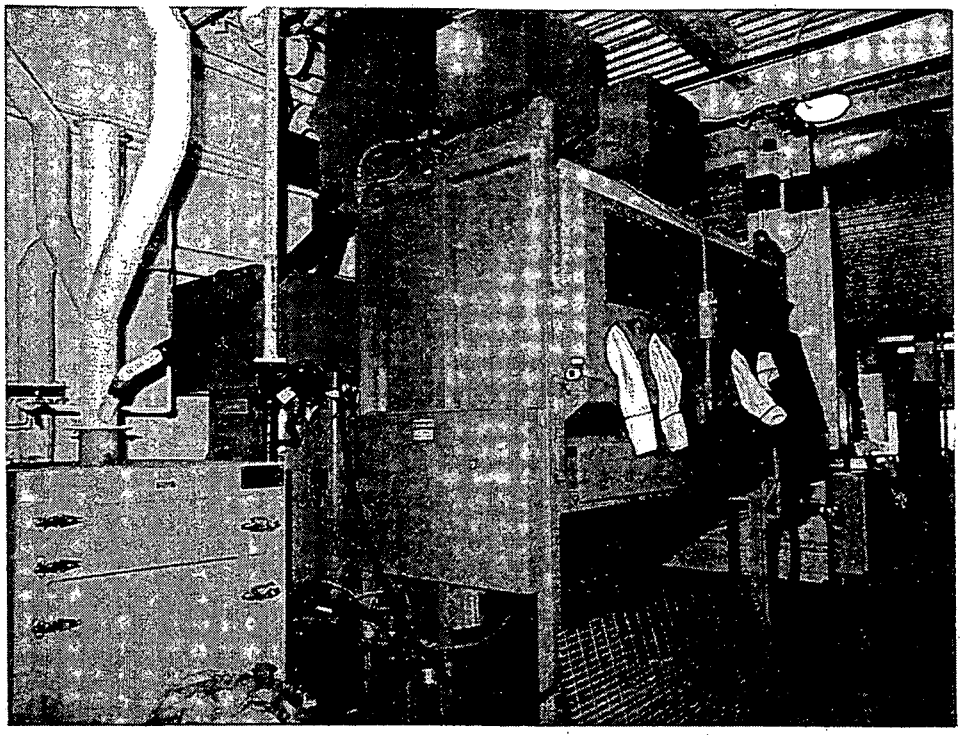

FIGURE E-35 Building 78 - Second Floor, Glove Bag Unit